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ABSTRACT

The papers contained in this volume deal with world perspectives, population communication, new communication technology and social needs, and communication in the future. Among the papers are: "Communication and Change in Global Institutions," "Foundations for East-West Understanding," "Youth and the Future of Population," "Population Communication Research and Population Training Programs," "Telecommunications Development--Intelsat and Beyond," "The ATS-1 Satellite Experiments," "Telecommunication Needs in Higher Education," "Applications of Communications Satellite Technology," "Ground Terminal Hardware," "Communication Technology and the United Nations," "Communication Revolutions: Past, Present, and Future," "Creating New Communication Technologies," "From the Microbiological to the Astrophysical in Human Communication," and "An Emergent System Paradigm of Human Communication." A new approach to communication study, one that calls for a re-evaluation of existing research as well as the investigation of new research directions, is suggested in the concluding paper. (LL)

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THE EAST-WEST CENTER is a national education institution established in Hawaii by the United States Congress in 1960. Formally known as "The Center for Cultural and Technical Interchange Between East and West," the federally-funded Center is administered in cooperation with the University of Hawaii. Its mandated goal is "to promote better relations between the United States and the nations of Asia and the Pacific through cooperative study, training, and research."

Each year about 2,000 men and women from the United States and some 40 countries and territories of Asia and the Pacific area work and study together with a multi-national East-West Center staff in programs dealing with problems of mutual East-West concern. They include students, mainly at the post-graduate level; Senior Fellows and Fellows with expertise in research and/or practical experience in government and business administration; professional study and training participants in non-degree programs at the teaching and management levels; and authorities in various fields meeting in international conferences and seminars.

A fundamental aim of all East-West Center programs is to foster understanding and mutual respect among people from differing cultures working together in seeking solutions to common problems. The Center draws on the resources of U.S. mainland universities, and Asian/Pacific educational and governmental institutions as well as organizations in the multicultural State of Hawaii.

Participants are supported by federal scholarships and grants, supplemented in some fields by contributions from Asian/Pacific governments and private foundations.

Center programs are conducted by the East-West Communication Institute, the East-West Culture Learning Institute, the East-West Food Institute, the East-West Population Institute, and the East-West Technology and Development Institute. Open Grants are awarded to provide scope for educational and research innovation, including a new program in humanities and the arts.

WORLD COMMUNICATION:

Population Communication

Communication Technology

Communication in the Future

Edited by

Jim Richstad and L. S. Harms

Honolulu

1973

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PREFACE

The papers assembled in this volume emerge out of a shared feeling that it was now possible to begin to unify and thereby strengthen the scientific study of human communication. The whole, we felt, was greater in an important way than the sum of its parts.

We found that combining one part of population communication, another part of communication technology and adding a dash of communication in the future did amalgamate into a new and greater entity. Synergy did operate. But something quite unexpected also happened.

As we edited the papers, it became apparent to us that in our quest for unity a breakthrough had been achieved. Lerner remarked that there was an unusual emphasis on "who talks back," and that "dimension by dimension a new paradigm was built up." Kumata observed that such a new paradigm provided a sharper research focus, a better means to develop theory, and a more clearcut vehicle for application. Taken together, then, the papers in this volume contribute to a "neo-Lasswellian" system theory of communication. We did not plan it that way. It was a happy accident or, in a word, serendipity.

The emergence of a new scientific paradigm and the research strategies necessary to develop it are activities that unfold on a worldwide scale. Consequently the term "world" remains in the title. We have, as is explained in the final paper, come to call the new theory, the neo-Lasswell theory.

The main sections of the conference reflected the interests of the key sponsors of the conference--the Commission on the Year 2000, the Social Science Research Institute and Communication Department of the University of Hawaii, and the Communication Institute of the East-West Center, The cooperation of the Commission for International and Intercultural Communication of the Speech Communication Association and the East-West Population Institute all added significant dimensions to the conference.

The conference was attended by 100 persons from Hawaii, from several Pacific locations, and from several states on the U.S. mainland. Among these 100 persons were scholars and professionals. As the conference papers reveal, there was a substantial variety in outlook. However, there was also a substantial unity in the quest for a more responsible approach to human communication. As should be evident in what follows, the conference was a lively one.

ACKNOWLEDGMENTS

We wish to acknowledge the contributions of all those who wrote papers for the conference, those who took part in the panels and discussions, those who reviewed parts of the manuscript, and especially the following:

Sponsors	East-West Center: Communication Institute University of Hawaii: Department of Communication, Social Science Research Institute State of Hawaii: Commission on the Year 2000
In Cooperation with	University of Hawaii: College of Continuing Education and Community Service, Interim Session Speech-Communication Association: Commission for International and Intercultural Communication
Conference Planning Committee	Richard Barber, Social Science Research Institute, University of Hawaii John Bystrom, PEACESAT project, University of Hawaii Jim Richstad, Communication Institute, East-West Center L. S. Harms, Conference Chairman, Department of Communication, University of Hawaii

THE CONTRIBUTORS

Chief S. O. Adebo served as Under-Secretary-General and Executive Director of the United Nations Institute for Training and Research from 1968 to 1972. He formerly was in the Nigerian government service, holding the rank of Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Nigeria to the United Nations and Commissioner-General for Economic Affairs (1962-1967). He holds a Bachelor of Arts (English, honours) from London University and a Bachelor of Laws (honours) from London University. He is qualified as a Barrister-at-Law (Gray's Inn, London). He holds several honorary degrees.

* * *

Everett Kleinjans has been Chancellor of the East-West Center since 1968. His experience in Asia dates back to 1948 when he stayed on in China as a college instructor for more than a year after the 1949 revolution. The Michigan-born linguist served as an educational administrator and a professor of English language and linguistics in Japan for most of the next 17 years. He was Vice President of International Christian University in Tokyo when he came to the East-West Center in 1967 as Deputy Chancellor for Academic Affairs. Dr. Kleinjans was appointed Chancellor the following year. He took the lead in developing new programs to enhance cultural interchange by focusing education, research and training on seeking solutions to vital problems of mutual concern to East and West. He is a well-known linguist, fluent in Japanese and Chinese, a teacher, administrator and author of books and papers on a variety of subjects.

* * *

James A. Palmore, Jr., is assistant director for institutional cooperation and research associate at the East-West Population Institute, and an associate professor of sociology at the University of Hawaii. Dr. Palmore is engaged in intensive analysis of surveys in West Malaysia and in Korea, on measures of family planning knowledge, attitudes and practices of married women. He has published numerous journal articles and has written Introduction to Population Methods.

* * *

James T. Fawcett is currently Assistant Director of the East-West Population Institute, East-West Center, and Associate Professor of Psychology, University of Hawaii. After receiving his Ph.D. from the University of California (Berkeley), he was affiliated for six years with The Population Council. He is the author of Psychology and Population: Behavioral Research Issues in Fertility and Family Planning (1970) and editor of Psychological Perspectives on Population (1973).

* * *

David Radel is Head of Population IEC Information Services at the East-West Communication Institute. His major responsibility is directing the Inventory-Analysis of International Support in Population/Family Planning Information, Education, & Communication. Prior to joining the East-West Center, Radel was an advisor for the Ford Foundation in East and Central Africa.

* * *

Dr. Florangel Z. Rosario is a Research Associate with the East-West Communication Institute and an assistant professor of communication at the University of Hawaii. Dr. Rosario is a graduate of the University of the Philippines, where she also did graduate work, and received both her master's and Ph.D. degrees in mass communication from Syracuse University. Her published articles on mass media and family planning include a paper in the Journalism Quarterly and several articles in Philippine national magazines and journals, including a weekly article on mass media for the Manila Times magazine supplement for two years. She has also been a member of the UNESCO (Philippines) Mass Communication Committee and the Communications Coordinating Council in Manila.

* * *

Huber W. Ellingsworth is Chairman of the Communication Program at the University of Hawaii and Director of Communication Graduate Studies. He is currently involved in developing concepts of communication training and in the use of communication for promoting family planning and population control. Research travel includes seven Latin American countries, Malaysia, and the Philippines. He is a former East-West Center Fellow and is the author of four books in the communication field.

* * *

Terry A. Welden, Ph.D. Michigan State University, 1961, is Associate Professor of Communication, University of Hawaii. He has been actively involved in developing and conducting communication training programs for 15 years at state, national, and international levels for government and education institutions.

* * *

Sanford Danziger, M.D., is an Associate Researcher at the East-West Communication Institute working in the area of training for family planning communication. He was a Peace Corps physician in Latin America, involved in rural health education projects. Later he worked with the Population Council and other private organizaticns in family planning.

* * *

Albert Horley was serving as Director of Telecommunications in the Office of the Secretary of the U.S. Department of Health, Education and Welfare at the time of the conference.

* * *

A. M. Greg Andrus was Chief, COMSAT Technology Program, National Aeronautics and Space Administration, at the time of the conference.

* * *

Robert Arnold was serving as Executive Director of the Alaska Educational Broadcasting Commission in Anchorage at the time of the conference.

* * *

Dr. Charles Northrip is currently serving as Satellite Experiment Coordinator within the Governor's Office of Telecommunication for the State of Alaska. At the time of the Major Issues in World Communication Conference, he was the Director of Media Services for the University of Alaska, where he served as general manager for the University's educational radio and television stations. Prior to that, he served as the first Executive Director of the Alaska Educational Broadcasting Commission. Dr. Northrip received his Ph.D. degree from Ohio University at Athens, and his B.S. and M.A. degrees from the University of Florida at Gainesville.

* * *

Glenn M. Stanley received a B.S. in Physics in 1950 and an M.S. in 1955 from Oregon State College. He has been associated with the U.S. Navy Electronics Laboratory (1952 - 1953, Arctic Aeromedical Laboratory (1958 - 1962), Stanford Research Institute (1966 - 1969), and with the Geophysical Institute, University of Alaska (1953 - 1958, 1963 - 1966, and 1969 to date). He was appointed Head, Task Force on Telecommunications in 1971, and Professor of Applied Science in 1972. Mr. Stanley's present interests are transionospheric propagation of radio waves, satellite telecommunications to remote areas, transmission of biomedical and educational materials to remote areas, and information bandwidth of the ionosphere. He is a member of the American Geophysical Union, URSI Commission III, Explorer's Club of New York, Telecommunications Advisory Committee of the Alaska Educational Broadcasting Commission, and a past member of IRE and Ionospheric Network Advisory Group (URSI/STP).

* * *

John Bystrom is a professor in the Communication Program at the University of Hawaii, and is director of the PEACESAT project. Dr. Bystrom worked in federal telecommunication projects before joining the University faculty.

* * *

Abelina Madrid Costa served as Assistant to PEACESAT Director in the Communication Program at the University of Hawaii at the time of the conference.

* * *

Paul C. Yuen is Professor of Electrical Engineering and Associate Dean of the College of Engineering. He is currently engaged in research on upper atmospheric dynamics using radio techniques with support from the National Science Foundation. One of his current projects involves the use of the telemetry carrier from the ATS-1 satellite for the measurement of total electron content. He has also evolved a technique for the early warning of tsunamis by use of an ionospheric Doppler sounder.

* * *

Katashi Nose is an Associate Professor of Physics at the University of Hawaii, and holds degrees from the University of Hawaii and Harvard. He also attended Temple, Stanford University. He has been an amateur radio operator for 41 years and writes for radio publications.

* * *

Daniel Lerner is Ford Professor of Sociology and International Communication at the Massachusetts Institute of Technology. Dr. Lerner has presented more than 30 research papers to learned societies, and has won numerous academic fellowships and honors. He has published 15 books, including The Passing of Traditional Society: Modernizing the Middle East; The Human Meaning of the Social Sciences; World Revolutionary Elites (with Harold Lasswell); Communication and Change in Developing Countries (with Wilbur Schramm). Dr. Lerner has served as a Senior Fellow and as a consultant at the East-West Communication Institute.

* * *

Peter Coraggio is an assistant professor of Music at the University of Hawaii. A Juilliard School of Music graduate with both his Bachelor of Science and Master of Science degrees in piano, he studied under Gordon Stanley and James Fiskin. Following a highly successful piano recital series in the Far East during 1963, sponsored by the Hong Kong Music Society, he returned to New York and continued studies in electronic music composition with Vladimir Ussachevsky at the Columbia-Princeton Electronic Music Center. Since joining the University of Hawaii Music Faculty in 1965, he has composed music for theatre productions, films, and ballets. He has also designed sound environments for light events and has presented numerous piano recitals and lecture demonstrations on today's music.

* * *

James Dator is an associate professor of political science at the University of Hawaii. Dr. Dator, a noted futurist, is also affiliated with the Social Science Research Institute at the University.

* * *

Kenneth Sanborn is Director of the Institute of Behavioral Sciences in Honolulu.

* * *

Andrew Yanoviak, A.I.A., was also serving as an assistant professor in New College at the University of Hawaii at the time of the conference.

* * *

L. S. Harms is associate professor at the University of Hawaii. He has recently completed a basic college text on human communication and a second book on intercultural communication. He is presently working on a project dealing with the communication rights of mankind. Dr. Harms was conference chairman.

* * *

Jim Richstad is a research associate at the East-West Communication Institute. He has worked in journalism as an editorial writer, copy editor and reporter, and taught at the University of Hawaii prior to joining the East-West Center in 1970. Dr. Richstad has written a monograph on the press under martial law in Hawaii and various materials on Pacific Islands communication.

INTRODUCTION

A conference dealing with population communication, communication technology and communication in the future can be a bit hard to visualize. Yet there are clear unifying themes that run through the three areas of communication--sometimes greatly amplifying the lessons of one topical area by use of examples from another. Out of the conference there also emerged what we started calling a "neo-Lasswell paradigm," an emergent paradigm, if you will. As noted in the preface, we didn't know what we were getting into, but we're glad we did.

In the planning meetings for the conference, we kept asking ourselves how [illegible] or will all of this fit together? We decided it would come in the links between these somewhat disconnected communication areas--the interaction of the ideas and the concepts. We started talking about the meeting as a "generator" rather than a conference, because we expected to generate new ways of looking at communication, and perhaps adding some fresh perspective to the study of human communication.

Daniel Lerner, as always an acute observer, picked out the two key themes that were generated in the papers and discussion in his summary of the conference--the concept of "talking back" and the concept of interaction. And what happened was that these points did not fit very well in standard communication study paradigm of "Who Says What to Whom Through What Channel With What Effect?" Lerner says those two concepts mean a major revision of the Lasswell paradigm, and a separate paper on the emergent paradigm is presented with the proceedings. Even the location of the meeting--the East-West Center in Honolulu--seemed to make the emergent paradigm naturally at home. The Center is based on the principles of mutuality and interchange, on an equitable basis. And the Peacesat system, developed at the University of Hawaii, stresses the search for communication needs, and for a way of meeting those needs through two-way, interactive communication. Peacesat stresses mutuality--a fair communication policy, as Lerner might call it--there is no center, people use the system as equals on an interactive basis, listening and talking when they want, not when a central communicator schedules. And finally, Hawaii itself has a special relationship to Asia, as a linker between East and West. The shifting tides of human and international relations, from a one-way dominance by the West to a growing mutuality, clearly fit the mood of the conference and the paradigm that emerged.

Hideya Kumata, another conference summarizer, focused on the need for new research methods for the increasingly complex, interactive technological society we find ourselves in, while keeping and nurturing the essential humaneness. Technology has overrun research, he said, and "we have not been able to pose the kind of questions and appropriate methodologies which are up to the times in terms of looking at the future problems."

Kumata points to the dangers of communication research becoming a social science *du jour*, moving from one specialized communication study area to other specialized areas, without developing adequate theoretical bases. Another key summary point made by Kumata is that communication research has selected topics and methodologies that "deliberately cut down the dimensionality of the variance," yet society needs answers to questions--such as those in population communication--in which "an overwhelming number of things...seem to be related."

The implications of the three days of the Major Issues in World Communication conference are profound, as we try to detail in the concluding paper. What has emerged, in our view, is a different way of approaching communication study, one that calls for a re-evaluation of existing research (the emergent paradigm can be traced in many works) and new research directions ahead. Obviously, there

is much development to be done with the emergent paradigm, and especially in ways to determine communication needs of the individual, community and society, as well as in international relations.

All of the topical areas of the conference related finally to the emergent paradigm. In paper after paper, the words "interactive," "two-way," "talking back," kept appearing. From Chief Adebo's description of communication challenges and problems in a world organization to the microbiological and astrophysical of Yanoviak, the conference examined the pieces and started putting them together in something new.

Chief Adebo talks about two kinds of communication--finding out what's going on in the world and telling the world what the United Nations is doing. He notes the particular difficulties in both outflow and inflow systems--language, bureaucracy, national sensitivities, lack of system control, and so forth. He also makes the simple but profound point that relates to the whole field of communication for social and economic development: change is okay for the next fellow but not for me. Chancellor Kleinjans goes into the cross-cultural communication situation faced by the East-West Center, relating to persons from Asia, the Pacific Islands and the United States. For much of the post-war era the flow of communication, knowledge, technical assistance has been one-way--from the West to Asia. Dr. Kleinjans is seeking ways to turn the one-way into a two-way interactive flow in a day-by-day educational system, and communication is often the heartstone of the effort. The East-West Center is dedicated to a "fair communication policy," to use Lerner's phrase, and is seeking the practical knowledge of the ways to develop a truly mutual communication policy and abilities. One of the crucial testing areas for a "fair communication policy" at the Center is in the field of population communication. That is, the East-West Center is at the same time dedicated to a policy of mutuality, a fair communication policy, and a large program of improving means of communication in the population field, one of the most sensitive and interactive communication fields, as the papers detail, we know of. The outcome of this massive effort is not yet determined but the interrelationships and implications of the conference papers should help deepen and direct the search for a fair communication policy in developmental areas, where developed and developing nations work together.

Population communication was selected as a major section for the conference because it is a world communication concern, one that must account for wide varieties of cultural attitudes and sensitivities. It presents in very hard detail the practical challenge of cross-cultural and world communication, and the hundreds of different ways the challenge is being approached. The population communication researcher is seeking the means of presenting essentially the same message in a wide range of cultures to a wide range of people in greatly varying situations. Has there ever been such a massive, world-wide communication effort with such a simple message? As the papers point out, the interactive nature of the communication environment greatly complicates matters for the researcher, but also increases the payoffs. The field offers a richness to the researcher--because of its seriousness, world-wide application, massive research and training efforts--that is hard to match in any other topical field. The message is for virtually every person in the world, but the means of delivery and evaluation are varied and complex as are the cultures of the world. Where else can the communication principles now developed and to be developed receive such a wide, diverse testing? Admittedly, population communication is probably a type of communication that Kumata calls "denial" communication--and for that reason has its own special applications and limitations.

Population communication emphasizes the communication <u>needs</u> and <u>rights</u> of the individual and the community. This same concern for needs and rights came out in the other parts of the conference--the discussion of communication technology and communication in the future.

A basic implication of the technology papers was that we have the technology for almost any kind of communication tasks. What is needed is the stipulation or formulation of communication needs in such a way that the technology can be brought to bear. And the danger, as also noted in the papers, is that some system or other will develop in the absence of clear statements on needs, and the system that develops may not be particularly concerned with the communication needs of the individual and community.

Technology itself can help ascertain needs, as noted in the discussion of Peacesat. The clear guiding principle was that the unmet communication needs of the Pacific Basin would be determined first, and then the technology would be found or developed to meet those needs. The Peacesat system in many ways demonstrates operationally the emergent paradigm. It is explicitly interactive, explicitly two-way. It is concerned with the unmet needs of the user, as a starting point, not with the needs of a central communication source. The Alaska system, by contrast, seems to be utilizing the same technology but in the more traditional communication sense. It appears to have "talk back" characteristics, but remains essentially central-source orientated--a central source is servicing others, rather than having all elements of the system engaged in an interactive mutual communication process. The two systems demonstrate different levels of need--one met by the traditional communication pattern, one by the emergent pattern.

The lesson is clear and familiar--the technology itself can be used in a variety of fashions, and one has to go beyond the intrinsic characteristics of the medium to the programmatic or operational characteristics of how the technology is used. Chief Adebo's second paper makes this clear in the United Nations' situation--the technology is there for quick feedback and interaction from around the world to the U.N. offices but the policial restrictions have so far prevented development of this needed feedback system.

Communication in the future is likely to be highly personal, highly interactive, and reaching not only around the world but to the past and perhaps even more into the future as well. It will involve intra-personal communication in a way now only becoming clear. Lerner's graphic description of communication revolutions of the past--with the ever accelerating pace--indicates a great expansiveness ahead. Corragio in many ways shows the implications of the communication revolutions in music. Communication in the future will be outer space and inner space; the whole communication universe is at hand. "Doing your own thing" has immense communication implications, as the papers point out. Dator talks of alternative futures, ways things could be. Communication technologies will depend in "part upon the need, the desire, and ability to communicate," Dator says, and then he describes possible developments in communication of human emotions through use of "sensory" inputs and videotape. This possible new communication technology, he says, could make symbolic communication--reading, writing and even speech--superfluous.

While each section of the conference had a meaning of its own, perhaps the most significant factor that emerged was first identified by Lerner in his summary--the Lasswell paradigm, which for more than [illegible] years has defined the main areas of communication research, was put aside. "We have studied communication," Lerner said, "as a linear operation in which a certain sender uses a certain channel to deliver a message to a receiver (an audience) who then is affected in some way by that message. Right from the very beginning of this conference that paradigm was put aside and dimension by dimension a new one began to emerge." The new elements to the paradigm are the concepts of "talk back" and interaction.

This dramatic, unexpected development from the conference is explored in detail in the final paper which, while not part of the conference itself, grew from it in a direct way, and is included in the proceedings for that reason. The implications to both the theory and practice are immense and probably controversial. They certainly are far from being fully clear and need much more thought and research.

So, the conference not only generated, at least for some of us, an emergent paradigm but brought together partly diverse communication areas into a two-way, interactive, participatory communication pattern that has profound implications. To quote from the emergent paradigm paper:

"In the most far-reaching ways, the emergent 'neo-Lasswell system theory of communication' permits re-examination of present communication systems, whether they be free-enterprise, socialistic or other forms, and whether they be in developed or developing countries. Such a re-examination can lead to a significant reshaping and improvement of present communication services, the political structures they support, and the economic interests they presently feed. Such are the immediate and obvious consequences of the development of the emergent theory.

When fully developed, it is difficult to say with certainty that any single social institution will remain unaffected."

That is a pretty big load for a three-day conference but at least some of us see it in the papers that follow.

I WORLD PERSPECTIVES

PREVIEW

Communication with a world perspective is not a simple thing, even when you use five official languages, as the United Nations does. Any communication from one culture to another requires a special kind of person or sensitivity, and perhaps a sense of humor and openness. Both the United Nations and the East-West Center, described in the following papers, face the difficulties of intercultural and international communication every day, and can count many failures with their successes.

The neo-Lasswell paradigm outlined in the introductory section and detailed in the final theoretic overview, stresses the importance of two-way interaction in human communication. Within that paradigmatic framework, we can examine the two papers in this section. Chief Adebo discusses the problems the United Nations encounters in its attempts to communicate with its many publics. Chancellor Kleinjans outlines the conditions for interchange within the East-West Center activities.

The nearly four billion people on this earth are spread across nearly 60 million square miles; the United Nations is headquartered in New York. Across the world, several thousand different languages are in use; the U.N. uses only five official languages: Chinese, English, Russian, French and Spanish. While each of these five languages are the first or second languages of many millions of people, more than half of the world's people are unable to communicate in any one of these five languages. Add to this that the median world age is about 17; and that approximately half of the world's adults, those over 17, are unable to read and write in any language.

At this point in history, the U.N., through its Office of Public Information "imparts" information throughout the world by distributing "News Releases" prepared in one of its five official languages. The media, newspapers, radios and televisions, then distribute this information as they see fit. Some newspapers, for instance, Le Monde of Paris and the New York Times, carry several U.N. news items per issue, and some of the items are extensive. Other newspapers, and other media as well, "impart" to their readers or viewers little if any of the news release material sent out by the U.N.

The situation is even more difficult when the U.N. seeks to "receive" information from around the world. The inward or upward flow of information is not adequately handled at this time, for various cultural and political reasons. The technology is here with satellites, but not the necessary human agreements.

Thus, while a neo-Lasswell paradigm of communication emphasizes the importance of "who talks back," there exists today vast communication systems that do not yet "build in" capacities for "talk back" interaction.

While Adebo discussed some of the practical difficulties encountered by a world organization when it attempts to engage in world communication, Kleinjans discussed the conditions within a world organization that does promote two-way interaction or, in a word, interchange.

Kleinjans notes that the East-West Center is characterized by diversity. First, persons come to the Center from some 30 different countries. There is a wide range in age levels. Different academic and professional specialties are represented as are different amounts of practical experience. The general goals are to share knowledge and attitudes and to engage in intercultural interchange.

The work done at EWC focuses on a number of problem areas. These problems are contemporary, concerned with broad human concerns, and of consequence to both East and West. All are at the Center to both learn and teach. And, all of these problems require a great deal of intense communication for their solutions.

Within the "small world" represented by EWC, Kleinjans cites a number of the characteristics of the communicator who succeeds in communicating with his fellow communicators from other cultural backgrounds. He notes the importance of seeing other persons as humans first and as members of other cultures second. He suggests that it is important to know about other cultures, to be able to withhold "negative visceral reactions," and to come to feel that other cultures are "intrinsically good." Finally, Kleinjans suggests that an "inner security" is required if one is to speak with "openness and candor" when the situation requires it.

Taken together, the two papers illustrate how difficult two-way communication on a world scale can be, and how important it is that such communication succeed.--L.S.H.

COMMUNICATION AND CHANGE IN GLOBAL INSTITUTIONS
by Chief S. O. Adebo

Communication and change is one subject that has always engaged my own personal interest. Change is important, of course. If you ask people, they will say they love change. Until they have to change themselves, then they are not so sure.

The one theme that runs through books on economics on the developing countries is that the developing countries are very conservative countries. They are very difficult to change. They never like to change their ways. Certain changes are impossible; reform is out of the question. Regarding change these people in the newly developing countries are very odd folks indeed. Since I come from one of them I agree with you. We are very odd folks indeed. But, in recent years it has become noticeable that a sizable proportion of those who live in the developed countries are rather odd folks, also. In other words, they also have changes to make and don't like them.

Only the other day an American friend of mine was saying, "I congratulate you folks. At least you folks know where you want to go. Quite frankly I don't know where we are going in the United States and I just don't even know where I would like us to go. Everything seems to be in chaos." He was, of course, exaggerating. Everything is not in chaos. But he was reflecting a mood that is persisting now in the developed countries, not only in the United States, but elsewhere. It is a mood that I welcome very much; that is to say I welcome the recognition that even in the developed countries change is important.

You have only to read the Charter of the United Nations. There are lots of principles initiated there, and when you contrast the action of nations large, small or medium, there you will recognize that we must all change. The founders of the United Nations, of course, wanted to change. The world they had known was a war afflicted world in which they had seen two great world wars in their own generation; they hoped that their children and grand children would see no more of such wars. So, the charter of the United Nations can be called a charter for change, to change this world.

You will find that the founders of the United Nations actually avoided the word "change" and wisely. They expressed themselves in more positive terms. They discarded the word. They wanted a new world to exist; they didn't say how we would get there. If they had begun to say that anybody would have to change, they would have had some difficulties. So, they said that they wanted to promote international peace and security, international economic cooperation, human rights, social development, and harmonization of national action to promote these ends.

Let us consider what the communication arrangements of the United Nations are to promote the attainment of these lofty objectives of the United Nation's charter.

Functionally, the position in the United Nations, of course, is as follows: The United Nations organization is now part of a system which we call the United Nations System. The United Nations as a global institution is referred to only because it is the one with which I am most familiar. That system comprises the United Nations, the specialized agencies like the FAO, the World Bank, WHO, UNESCO, etc. It also comprises organizations like the United Nations Development Program, which is a child that has almost swallowed its father, and our own institution, UNITAR. All these we now call the United Nations System.

What are the communication arrangements of the United Nations? Three kinds of tasks are performed by the United Nations communication agency. Within the United Nations itself, it handles its international and also inter-agency communication. It handles what might be called the external communication with member states, and finally it handles communication with members of the world public.

In regard to internal communication and inter agency communication within the United Nations System, an institution called the Inter-Organization Board for Information Systems and related activities in Geneva has been recently established.

The public is mostly interested in the area of external communication. And here opinion is not unanimous that the United Nations has an efficient Office of Public Information. Like any other department of the United Nations, it was created long ago and then began to grow like topsyturvy. Some say its head is too big or its nose too large or its belly is too thin or its legs are not longer there. Few seem to feel that it's doing a good enough job. Some have a feeling that the folks at headquarters who write scripts, while they are very good in terms of substance, don't show much imagination in selectivity of material, and are worse still in presentation.

The communication is to people, yet the OPI has no means of directly reaching the people. The OPI issues material in some cases directly to newspapers in the countries concerned. In some cases this is not permitted and the material has to be issued to a government agency which decided what to publish or not publish. In both cases, the OPI is not in a position to indicate what should be published or not published, on what date the publication should be made, and so forth. This is something outside the control of the OPI and so long as that happens it will not be right or fair or just to insinuate that the OPI is responsible for the ineffectiveness of the dissemination of materials relating to United Nation's activities.

There is a second impediment that is outside the office's control. The United Nations works in five official languages--English, French, Spanish, Russian, and Chinese. In my own country of Nigeria we have over 200 languages. In the world as a whole, many times more. In the United Nations each country has to select one of the five languages so that materials can be supplied to it in that language. So, for Nigeria, we chose English, India chose English, Ivory Coast chose French. You know what tiny proportion of my people understand English, what tinier proportion of the people of the Ivory Coast understand French?

I was in Italy sometime ago, about 18 months ago. I was not in Rome. I was in another town and I went about looking for materials about my Institute. There wasn't a single thing and then I looked for materials issued by the OPI. I didn't find any in any of the places I visited. I was told the obvious reason that

Italians don't speak English nor did they speak French nor did they speak Spanish or Russian or Chinese. They preferred to speak Italian. Of all the 132 countries in the United Nations, Italy is one of the most informed and one of the most assiduous in distributing the United Nation's literature. But even in Italy, the authorities can only reach a very small proportion of their people with translation.

You can therefore imagine how difficult it is to communicate with the world about world events in the United Nations. This is not something within the control of the United Nations, however hard we try. We cannot overcome this particular problem. If the director of the OPI in one country finds that it has some new funds, he promotes some translation to help reach more people in that country. But only in a very tiny minority of cases can they do anything. So these are problems that we cannot immediately solve.

Of course ours is not a static world and there is constant progress in the field of communication generally. Whatever can be of use in one area is bound to be of use to us at the United Nations.

Some six years ago I went to a Roman Catholic college in California to deliver the commencement address. After I had finished one of the priests asked me if I was aware of the great things that were being done now in the field of communication and that in a few years the United States would be able to reach every land in the world with all those satellites floating around the place. What immense good this was going to bring to the world! I said, "Father, I couldn't agree more about the revolutionary nature of the development. I am not so sure of the good it will bring." I seemed to have dampened his enthusiasm. So, I explained myself. I told him some of the problems that occurred to me because of having been in the United Nations for some years. I happened to have seen rather more than he had seen of the way in which very potentially good things could be abused and distorted instead of being used for the good of humanity.

I just was honestly afraid that the new communication technology might be misused. Already in the United Nations some of the new technology is being used or at least preparations are being made for the use. The OPI has set an inter-agency computer system in Geneva to help to coordinate all the information within the United Nations System relating to economic and social development.

As soon as communication satellites became a fact, the United Nations moved to discuss how those facilities could be made available to the United Nations. Discussions are still going on.

The new technology is going to create as many problems as it solves. It is going to produce instant communication; but instant communication will be a mixed blessing. In this country the use of television for lecture learning is now an inevitable fact of life. There are those who complain about it but there is nothing they can do about it. It has come to stay. It has been a mixed blessing here as it is also in the United Kingdom or elsewhere.

It will be used in the United Nations just as it is used nationally, and it could make it possible for all the world to see the proceedings on television of the Security Council or of the General Assembly. I am not sure, however, that it will always be an edifying spectacle and that this instant communication will enhance the image of those organs.

I could tell you a story here to underline my feeling of uncertainty. My youngest son came to the United States to spend his holiday at the time when we were holding a discussion in the Security Council. We were all watching this on television and my son was laughing and I said, "Why are you laughing?" and he said, "Was that the Security Council, Dad, on which you served before?" I said, "Yes." He said, "I'm sorry for you." I had to explain to him that, although the gentlemen he saw spoke the way they did, that was not the end of the matter. They were going to talk in the lobbies and eventually they might come to some sensible solution. Then he said, "But, Daddy, why do they have to start in this stupid fashion?"

Well, of course, that is the trouble with the world. We, the older people, are quite used to these stupid ways of telling one another lies that do not deceive and calling it diplomacy. It no longer shocks us as it shocked this young man. It may be, then, that if we get instant communication and everybody sees what happens in these organs, people will write protest letters to those who make the naive interventions. We might get on to improving the quality of debate and the general performance in the organs of the United Nations. On the whole, I think that instant communication would be a great blessing.

A few years ago at UNITAR we initiated a study which required the cooperation of a great many people in a great many lands. We brought as many as 50 countries into this. We selected three different periods of two weeks each. We produced a questionnaire and sent copies out to newspapers in different lands. The number of newspapers that responded to our call was over 1,200 and we have in our archives more than 45,000 items of information from these newspapers from 50 countries. The purpose was to find out how much of United Nation's activities got reported on the radio and in the press in the different countries. The results have been staggering in some cases. In others they only confirmed what we had suspected.

Everybody knows that in the developed countries too much emphasis in all these media is given to political reporting and not enough to economic and social reporting. It is also clear that the reverse is the case in developing countries, for understandable reasons. But what will shock you is the great amount of indifference in certain countries to the United Nations and its activities. And this is one of the areas in which instant communication might help. But it would help only if certain practical problems could be overcome. Instant communication raises question of who is communicating, what he is communicating, and with what angle he is communicating.

Can these problems of instant communication be solved? Are people going to allow you to communicate with the people without their leave; and, if you ask them, will they not say no? I am sure when the first sputnik went into the sky, if you had asked the senators in Washington two weeks earlier, whether if the Russians put a sputnik in the sky they would agree that it should pass over the United States, they would have said an emphatic no. But the sputnik did pass over the United States, American satellites pass over the Soviet Union. No one can stop them.

Like any other innovation in the world, like atomic power itself, these technological things are inevitable; we cannot arrest the march of progress.

We have to live with all of these things. What we have to do is to try and to foresee and to forestall some of the dangerous tendencies in these developments and having foreseen them, to plan courageously to deal with them so that these new forces of change can be harnessed to the best interest of humanity.

FOUNDATIONS FOR EAST-WEST UNDERSTANDING
by Everett Kleinjans

The world has shrunk so dramatically in the past several decades that lack of understanding between the peoples of the world can no longer be allowed to persist if the human race is to survive. Advances in communication ranging from satellites to jumbo jets have made us all next door neighbors whether we live in Chicago, New Delhi, Tokyo or London. Unfortunately, many of us do not understand our new neighbors. Although we can invite South Vietnamese peasants, African revolutionaries, and Japanese student radicals into our homes every night via television, we don't really know, understand or sympathize with our guests. Misunderstandings between neighbors can lead to arguments and neighborhood brawls. In a global village, misunderstanding can mean nuclear destruction. There is no room left in our global village for intolerance, prejudice and ignorance.

At the East-West Center, we are trying to do something about this tragic gap between the technological advances that have made us all neighbors and our attitudes toward and knowledge of our new neighbors, which have often remained at much the same level as our father's and grandfather's. The East-West Center is a unique experiment--an attempt to build a laboratory in which the seeds of understanding between East and West will sprout, grow and flourish. There is no blueprint constraining its shape. It need not follow any foreordained scheme of the usual university courses or of any departmental structure. It doesn't have to follow the pattern of a conventional research institute or training school. We are free to experiment--to develop our own blend of activities and structures for achieving understanding.

The catalyst for this experiment is interchange--intellectual, cultural and technical exchange between peoples from Asia, the Pacific and the United States. Our laboratory has been built on four elements, each contributing to the flowering of those thin lines of trust, friendship, and common interest which tie men together in a community of understanding.

First, the Center is a national institution with national support and goals. It was founded in 1960 by an act of Congress and formally established through an agreement between the Department of State and the University of Hawaii. The Center continues to receive the bulk of its funding from annual Congressional appropriations. The Secretary of State, who is responsible for the Center through the Bureau of Educational and Cultural Affairs of the Department of State, has appointed a National Review Board to represent the national interest of the programs and plans of the Center. The East-West Center is an expression of the voice of the American people to build understanding and friendly relations with the countries of Asia and the Pacific. On the other hand, our goal is not to try to convince our participants of the rightness of immediate foreign policy decisions of the United States government.

At the same time, and of equal importance, the East-West Center has a broad international focus. Our international staff members, degree students, professional trainees and senior scholars come from the 50 states of the United States and over 30 countries, from Afghanistan to Korea, from New Zealand to Japan. This community of culturally diverse individuals works together, exchanging views and knowledge on a mutual basis and, when at its best, giving trust and developing concern. The West is not the teacher, nor is East the eager student. The insights of all are assiduously sought, for through such mutual sharing we come closer to truth. At the Center, our purpose is to have everyone both a teacher and student, learning and sharing knowledge with everyone else on a mutual basis.

As far as we know, the East-West Center is the only United States educational institution with a majority of participants from Asia and the Pacific. In the past 12 years, 23,000 people have participated in Center programs and returned to Asia, the Pacific Islands and the U.S. to pass on their new knowledge and understanding of others and to build a network of connecting links between the East-West Center and the Pacific world. In addition to these alumni relationships, the Center is actively working out cooperative research and training relationships with many first-rate Asian and Pacific institutions, universities and agencies.

The third cornerstone is educational. The Center maintains a firm educational identity through programs which encompass study, training and research. The cooperative arrangement between the East-West Center and the University of Hawaii allows us to utilize the University's many educational resources. In addition, cooperative arrangements are developing with educational institutions in Asia, the Pacific and the U.S. mainland. Within the Center, an interdisciplinary staff of experts in fields relevant to our programs provides the Center with built in academic competence.

Finally, the Center has a distinctive programmatic thrust for its activities and resources. Beginning in 1970, after more than two years of planning and discussion with Asian/Pacific and U.S. educators and administrators, we began to pursue our objectives through new programs built around real-life problems that face us all. In each program, degree-seeking students, senior scholars, administrators, and other professionals gather around mutual human problems in which they have expressed a concern. We try to organize their study, training, and research activities so as to enable them to interact in pursuit of solutions. The persons gathered come from widely diverse cultures and different age levels. They bring to bear on these problems different specializations of knowledge, and practical experiences.

There were many reasons why the East-West Center adopted problem-oriented programs. Perhaps the two fundamental ones are the educational value and increased interaction of participants resulting from such an approach. Education becomes dynamic when teachers and learners are engaged in the solution of actual problems. In conventional education, students are presented with hypothetical problems with already determined answers available from the teacher or the back of the textbook. Even in the case-study method, where problems are presented for solution, the problem chosen may be hypothetical, and in any case, since the students are not accountable for decisions, they are not engaged in a "real" solution.

The problem oriented approach has a number of characteristics which give it special educational significance;

1. It sets forth an actual problem of some consequence, to which there may be several possible solutions, or perhaps only inadequate accommodations. Furthermore, it requires fitting theory to reality. Instead of a "think tank," our Center is a "think and do tank."

2. All those engaged in and being educated through this activity are finding data or making decisions which have the possibility of affecting men's lives; this feature adds the mood of seriousness which education needs.

3. Since the student is part of a cooperative research program, he must participate actively if he is to contribute to the solution of the problem. This realization should give definite focus to his class work, helping him to relate his work to an ultimate goal, not merely the passing of a paper-and ball point test.

4. If the educational crisis evidenced by student revolts on the campuses of American and Asian universities during the 60's is indeed a crisis of involvement, of students wanting their studies and activities to be relevant to individual and social life, then this problem-oriented design may help to provide the relevance.

Secondly, these programs are designed to enhance interaction of participants so that international understanding will be facilitated. Interchange is affected by the following factors:

1. People interact more in smaller groups than in larger groups.

2. The more people associate with each other in small groups which have well-defined goals and values, the more cohesiveness will develop.

3. People with similar personal goals working together toward a common end will tend to develop respect for and trust in each other.

4. As people continue together toward a common task, less communication is devoted to the task and more to the personal relations of the members.

5. People who live under very similar conditions--especially if they experience the same inconveniences--develop a strong sense of camaraderie.

6. People who work together on a problem and make progress toward its solution learn that cooperation is possible. When these people are from different countries and cultures, they learn that cooperation is possible despite differences--a long step toward understanding.

Our problem-oriented programs take these factors into account so that the amount and quality of the interchange is maximized producing conditions conducive to understanding.

We recognize that the problems of the world are complex and cannot be easily pigeonholed into neat slots of economics, psychology, biology, political science or philosophy. Therefore, our programs, which concern the problems of real life, are tackled on an interdisciplinary basis. Such programs, although academic in nature and content, do not duplicate university programs but are complementary to them. Whereas in a university, scholars are most often grouped around a common discipline, presided over by a chairman, and are called a faculty, in the East-West Center, participants are grouped in programs centered around a problem, are drawn from several disciplines, and are presided over by a director.

There is no end to problems of common concern to East and West. Therefore, it was difficult to determine which problems should be approached by the East-West Center. The following criteria were used: 1. the problem must be contemporary; 2. it must be broadly human or international as opposed to national; 3. it must be consequential to both East and West. As a beginning we have selected five problems as the basis for our programs.

Our Communication program is concerned with the processes of sharing knowledge and attitudes among cultures and subcultures for enhancing the quality of life, and with the effect cultural differences have on these communication processes and on access to them. The program helps develop individuals who will strengthen mass media and other communication systems. As you all know from your own experience, the best planning in the world will fail if you can't communicate your ideas to others, or respond to ideas from others.

Our Culture Learning program concentrates on how one learns his own language and culture--a good part of this learning being outside of formal education--and how another culture can be learned without losing one's own identity. We use the term "culture" in the anthropological sense, namely the patterned ways of thinking, feeling, believing and behaving of a people. Thus, in this program we are exploring the questions: how do we learn cultural behavior, how can we improve language learning, and how can we learn another culture through encounters with its creative works in music, visual arts, theater, literature, history, philosophy, and with its religious traditions? As the world grows smaller, each of us must be able--at the very least--to "get along" with peoples from other cultures.

Our Food program is concerned with the complex interrelationships among the production, processing, distribution, and consumption of food on the one hand and the technical, economic, political, cultural and social aspects of each of these elements on the other. Task groups are concerned with agricultural diversification and multiple cropping, crop protection, planning and implementing public programs and policies, food quality, and agribusiness.

The Population program concentrates on analyses of the causes and consequences of population change; the quantitative and qualitative effects of population growth upon economic and social development; the economic, social psychological, and environmental factors that determine demographic behavior; the evaluation of policies and means by which societies try to influence population processes, the possibilities and means of improving society's capacity to deal with untoward consequences of population growth; and specific research in the field of demography.

The Technology and Development program is concerned with anticipation of the consequences of scientific and technological advances in the processes of planning and managing development. Specific themes include developing innovative, risk-taking entrepreneurs in both the public and private sectors; transferring relevant technologies from one society to another; building modern societal institutions, and carrying out integrative planning. Urbanization, in particular, has underscored the need for finding ways to adapt and create new technologies, to deal with our problems.

In conclusion, our four cornerstones--national, international, educational and programmatic--form the foundation for the stimulation of interchange and the development of understanding which are the goals of the East-West Center. We are confident that our experimental laboratory here in the middle of the Pacific Ocean is providing some important answers to the ever-increasing need for building understanding in a world that has become a global village.

We hope that all of the people who come here will become cross-cultural communicators, able to enhance the flow of knowledge across national and cultural boundaries. Actually, good cross-cultural communicators are scarce, and many must be trained. What are the characteristics of such people?

First, cross-cultural communicators must see people as human beings first and as members of a certain nation or culture second. In a very real sense all men are brothers. Our common humanity means that we all have the potential to become members of any culture, at least at birth. In fact, any child born into any culture will learn that culture and its language regardless of the race or nationality of his parents. Of course, beyond the differences of culture are the many individual differences that make each of us a unique human being. In fact, individual differences are possibly greater than cultural differences. Therefore, the communicator must remember that although all men are brothers, all brothers are different. This has been a painful learning process for Americans over the past few decades. We have learned that people do not fit into a melting pot. They are different and should remain so. Furthermore, we must come to learn that these differences are beautiful, for they make our common humanity rich in diversity.

Second, the cross-cultural communicator must feel that the culture of the person or people with whom he is communicating is intrinsically good; i.e., good not in the sense of being a means of satisfying his curiosity but in the sense of being a thoroughly valid human expression of man on this earth. Every culture which has developed on this earth is a dynamically structured system, a design for living out one's life of relationships to one's fellow man and the world around him. Whether one places first priority upon the individual or upon the group will depend upon the culture in which he was reared. Either can be, and is, a thoroughly human way of organizing reality. The differences are there, but the differences are legitimate, and when thoroughly understood, are seen to be good.

Third, the cross-cultural communicator should have a knowledge of and sensitivity to the cultural values of the people with whom he is communicating. This is not always possible, and for a person working in an organization like the United Nations, it may be completely impossible, for example, to know the cultural values of all the 131 member countries, but he should develop a minimum degree of cultural sensitivity. Certainly, he should not read his own meanings into the communication devices of another culture. When Americans, for example, see Japanese bow to one another and read obsequiousness into that action they are misplacing values and causing misunderstanding.

Fourth, the cross-cultural communicator must acquire the ability to withhold his negative visceral reactions until he has ascertained whether he has grasped the true meaning intended by the person he is communicating with. He must have restraint in his emotional behavior. I recall an incident from my years in Japan. The maid working in the home of an American in Japan came to the lady of the house to express her wish to quit. The American housewife had studied only a little Japanese. The maid said, "Yamesasete idadakitai to omoimasu ga..." which the American translated as meaning "I would like to receive your causing me to quit." That is the literal translation. The American's reply was, "I am not causing you

to quit. Why don't you say you don't like it here and want to quit?!" The American housewife failed to ascertain that the language the maid used was the polite way of resigning. Anger can cause bad relations, and it is unfortunate if the anger is unwarranted.

Fifth, the cross-cultural communicator must learn to speak with a great deal of openness and candor, especially at the beginning. When people learn a second language as adults they usually use it only on the referential level. The subtle connotations are usually lost. I can remember working with Japanese in situations where the communication was completely in the Japanese language. There were times when I thought I had understood everything but found that my Japanese colleagues came to a different conclusion from mine. One day I checked with the president of our university to see whether I had understood everything. Yes, Mr. X had said this and Mr. Y had said that and the president had said what I thought he had said. "Then why did you come out where you did?," I asked. The reply was, "You must listen for what is not said." Native speakers, speaking together, use many short cuts, and make many assumptions about the storage of information of their fellow countrymen. Non-natives do not have that same store. Therefore, the necessity for less subtleties and more directness, for candor.

Sixth, a cross-cultural communicator should have the inner security to see things done and said in a way different from his own culture, with different symbols and meanings, without feeling that his own ego or identity is being threatened. Whether a man holds a door for a woman to permit her to go through the door first is a matter of culture. Yet I have seen some non-Japanese women feel that they were being personally insulted when Japanese men went through the door ahead of them, especially if they happened to be holding the door open. Probably the greatest manifestation of the kind of inner security I am speaking of is the kind that comes when someone has a good sense of humor about himself. In fact, one of the great sources of humor in all cultures is the foreigner who does not know "our" ways. Laughing with people of another culture about oneself is one of the greatest forms of communication.

Can these qualities for cross-cultural communication be taught? Possibly, like leaders, good cross-cultural communicators are born, not made. Inner security, for example, may be the result of a composite of one's parental heredity and one's early childhood environment. A person who is insecure in his own culture will more than likely be more so in a cross-cultural situation. This is one of the problems to which more attention must be given, by those concerned with world communication. Certainly, it is a problem to which we hope to direct attention at the East-West Center.

II POPULATION COMMUNICATION

PREVIEW

Population communication is one of the more exciting and rapidly growing areas in the study of communication, even growing more rapidly than the worldwide efforts to gain better understanding and control of the factors influencing population growth. Precisely because population communication is on a multi-cultural, worldwide basis, it is of great academic interest.

The challenge is dramatic: how to convey some of the most intimate kinds of information in a wide range of cultures, many of which have very restrictive views of what is proper public and private discussion of such matters. And if ways aren't found to deal with these communication factors on a culture by culture basis, many of the economic gains will be absorbed by a too fast increase in population.

Population control is only one factor in a wider developmental communication context. So, we are not talking about small matters, or easy matters.

Okay, so population communication is a sensitive, important, challenging, worldwide problem, so what can we learn from it that we can't find in the traditional study of communication?

Some people feel that there is no such thing as "population communication," that it uses the same principles and techniques of other forms of communication, and particularly of developmental communication. And others raise the question that you cannot study or practice population communication in isolation from other forms of developmental communication. The population communicator may be urging reduced family size, the agricultural agent may be showing how to increase farm productivity in a way that requires more labor. The messages might be confusing to the farmer and his wife, especially when other developmental communicators urge him to do other, seemingly conflicting things. Kumata, in his remarks as responder, said the population communication field is breaking new ground. He noted it is something different, in the context of denial communication. Kumata said we have to investigate "whether denial communication really is a species which is different in quality rather than just more complex phenomena of the same kind of things we have been doing."

Kumata also said population communication involves "an overwhelming number of variables which seem to be related," going against trends of "deliberately cutting down the dimensionality of the variance." Population communication is removed from the latter context, into the neo-Lasswellian context, as discussed in the introduction on implications section of these papers.

The papers in this section offer some startling answers--or at least provocative probes. We can find new communication theories, Rosario tells us, or at least stimulating interrelationships. We can revise much of our thinking about training, Ellingsworth tells us. We can find out much we don't know about the "target that talks back," Palmore tells us. And so on through the papers.

Population communication touches the sensitivities of a society in a way that has seldom been seen--certainly not on the scale of today around the world. Massive population control or family planning campaigns are a fact of global life--it would be difficult to escape them.

Population communication brings up basic questions on the right to communication and the right to know, and not just in the Western cultural context but around the world. It is fast becoming an offer that can't be refused, and in many ways challenges traditions of centuries on the right to and availability of certain kinds of information.

These papers give resounding support to two of the main points made by Daniel Lerner and Hideya Kumata. Lerner's point is that we have a major revision of the traditional world of communication study, that we have an emergent paradigm, that we must study the whole, continuous, interactive communication process, and not limit ourselves to a linear study from the communicator to the audience. This is given very human detail in Palmore's paper. He finds that the "target notion" of communication is particularly inappropriate to population communication, because the basic values the communicator is seeking to influence have been built over a long period of time by "many persons as well as the mass media." "Before" and "after" experiments don't work very well, he says, because people aren't passive targets--they will talk about matters affecting population; it's thoroughly a part of human life. "Population communication," Palmore says, "is not simply another form of beer commercials. We are talking about basic, important issues when we deal with population communication and I don't believe the "target" audiences will be convinced by yet another beer commercial with a family planning message."

We learn from Palmore's paper that people are not "targets," but communicators themselves in a very active way, ways which the communication researcher must examine if he's going to know what's going on. The difficulty of the researcher is immense--how to isolate something everyone talks about, and determine effects of particular messages. Palmore is telling us that present-day communication research is often based on a stationary target concept, and the targets move. What are the research techniques for the moving targets?

Dr. Rosario's paper relates communication theory and models to the particular task of population communication. She relates us all to training areas in the domains of the cognitive, the affective and the behavioral.

There is a constant effort in population communication to get where the action is--to relate the theory and research to policy and program implementation. The questions may not evolve around the beauty of the research design but on the ultimate question in population communication, "how much did a program reduce the birth rate?" As Rosario's paper linked the researcher and the theorist with the action of training, Radel's paper asks researchers to work with the administrators on choice of variables and research problems and to increase availability and understandability of research results so the administrators can put findings to use. Here again we see a target that moves--the administrator has his own interactions and processes. The researcher must find the right sets of interaction if he wants his findings translated into action. Radel finds the academic researcher perhaps too far removed from the needs of the population program administrator, and suggests that the ways of the market researcher are more tuned into this field. Is this another lesson population communication can teach? Or do we already know it?

The task of population communication, Radel says, is "to change some of the fundamental values and behaviors of more people in a shorter period of time than ever attempted before in the history of the world." And through the largely unexplored intricasies of hundreds of different cultures.

One of the basic variables in communication research is examined by Dr. Fawcett in his paper on youth, population and communication research. The high proportion of youths in the world is itself a result of the population boom, and, literally, the most fertile audience of population communication. And this audience is sadly neglected, Fawcett says, by population communication people more fascinated with the mass media than with the classrooms of our schools. But for those who drop out of school, for those in early adult years, and for those who don't have the opportunity for much schooling, the mass media will have to be a main carrier of population communication. Fawcett raises the question of population communication on a global basis via satellite and other advanced technology. How does the research start on that one, as Kumata asked?

Fawcett also challenges the concept that knowledge will lead to a change in attitudes and behavior, and particularly so "when the topic encompasses sex, contraception and family relationships." And he urges that those on the other side of the generation gap listen to youth as well as talk to them.

The set of papers on training in population communication draws distinctions between education, training and attitude change, and finds the present-day terminology and practices confusing, overlapping and not much use at all. Dr. Ellingsworth, for example, specifies seven characteristics that distinguish training from education. Dr. Danziger makes the point that in developmental communication training the method of training and the tools used must be appropriate not only at the level of training but at the level where the training will eventually be used. He also urges the increased use of radio in developmental communication, suggesting that the medium is flexible, inexpensive and largely untapped.

One point in both Ellingsworth's and Welden's presentations seems to be that training is very single-minded and linear, yet we increasingly are in a multi-minded world that is not very linear, at least in much of the kinds of communication we are talking about in these papers. This means the problem of training in communication is even more complicated and difficult, and effectiveness more elusive to the evaluator, because, indeed, the trainee also "talks back."

Palmore and Fawcett point up the needs for research, and Radel says there is a vital step beyond research--the linker role between research findings and their use in population communication programs. Rosario, too, discusses research in regard to how it relates to action or training programs, and Ellingsworth, Welden and Danziger explore the theoretical and practical aspects of developmental communication training.

We find in these papers that it would be nice for research and training if people would be stationary targets, if they would stay still and absorb the communicators messages and trainers instructions. But, the papers are clear, this is not the world as it is. The audience or target talks back, moves, stops and starts by forces largely beyond the ability of the researcher to identify and isolate in a research design and of the trainer to control by curriculum. In a problem area of great difficulty to begin with--population communication--the challenge for both the researcher and trainer is immense. As Kumata noted, the payoff can be great.

And, as Hu Ellingsworth reminds us, population communication is of special interest to the scholar because it is a "package deal." One can focus on mass media or on interpersonal communication or an interaction of the two. In its process state, it blurs the artificial distinctions between interpersonal and interposed communication. It also has observable outcomes of tremendous social significance.

Population communication is particularly valuable to communication research because it is so difficult, so interactive, on such sensitive and deeply protected cultural factors. If the researcher can unlock the means of success in this field and translate it for the administrators and trainers, there should be far-reaching implications for the study of communication.--J.R.

THE TARGET THAT TALKS: PERSONAL COMMUNICATION AND POPULATION RESEARCH

by James A. Palmore

People bear little resemblance to targets, whether the targets are metal, straw or simply tin cans at which one shoots. Targets neither return nor re-shoot the arrow or bullet; population communication "targets" do. When the communicator speaks of the "target audience," he unfortunately may act as if the receivers of the communications actually have target-like characteristics. They do not. They talk. They think. They communicate back and they communicate with each other (Palmore, 1967).

When we deal with population communication, the target notion is particularly inappropriate. Most basic attitudes, values, and norms about population involve communication over long periods of time and with many persons as well as the mass media. Let us consider a few examples.

How and when does each person acquire his attitudes and values about each of what Davis and Blake (1956) call the "intermediate variables" affecting fertility? Should one marry? What is a proper age to marry? What coital frequency is normal? Is contraceptive use tolerable? Is induced abortion morally justifiable? Should one become divorced or separated or desert a spouse? If one is widowed, should one remarry? All of these questions involve communication.

The family communicates (or fails to) on these questions. School books and peers communicate on these questions. In fact, virtually constant communication takes place on these questions. The stuff of gossip (extramarital affairs, divorces, etc.) is heavily endowed with population-related messages.

Until we begin to realize such basic facts, all population communication campaigns and all population communication research will remain a bit disreputable.

Let us set a not too unrealistic scene. The clever researcher fresh from graduate school carefully plots his ingenious experimental design: he will test a communication campaign in "experimental" and "control" areas of a big city. In the experimental areas, he will do the newest and best of everything by way of mass media communicating. In the control areas, he will do nothing. He will have "before" and "after" measures. He will be a scientist. Ah, but you and I know his experiment is full of flaws. People talk; most of them don't know about experiments and probably wouldn't be terribly impressed if they did know. Our clever fresh Ph.D. claims "contamination," hangs his head and weeps, and finally decides communication research isn't all that interesting anyway. No doubt he could become a demographer or perhaps a passable fisherman. Or perhaps he could become divorced and forget his professional troubles--bringing us full cycle back to the fact that the stuff of gossip is population communication. (The next time you have an affair or discuss having one, remember you are indulging in population communication. It's a sobering thought and may yet make a moral person of you.)

Should I continue on a sober note? I think I must, else someone may think I am also a demographer or, better perhaps, a fisherman.

Directed change of population communication is no simple matter to be left to amateurs. If the survival of the species hangs on population matters (and it does), it is worth more than extensions of theoretical statements from research on political, agricultural, beer, or deodorant communications. A major effort must be initiated and pursued with some intelligence and integrity.

We may begin by dispensing with the simplistic idea that urban-rural residence, educational attainment, ethnic groups, income, and other such variables explain most differences in population behavior. There are more theoretically appealing and intuitively explanatory factors than these, and I believe communication patterns are one of these more appealing factors.

Part of what we measure in urban-rural differences, for example, is differences in communication patterns. Besides, if our goal is a meaningful guide to social planning and social policy, it is easier to change communication strategies (and hopefully alter communication patterns) than it is to change whether someone lives in an urban area or a rural village.

Having dispensed somewhat heretically with much conventional sociological wisdom, I come to the weak point I have avoided for so long in my presentation: What research should we do and how should we do it?

Critical questions are easy to ask. A few we might ask are:

(1) Who are the population influentials and opinion leaders? Is the I.U.D. opinion leader the same person as the influential on the pill or the feasibility of divorce? Of marrying young? How do the characteristics of opinion leaders vary from society to society or one type of communication campaign to another? What factors either impede or facilitate the interpersonal communication process? (See Palmore 1967 and Palmore, Hirsch, and Marzuki 1971).

(2) What life cycle and developmental changes are there in interpersonal communication patterns about population? Surely certain topics for communication are of interest only to youth, others only to old folks.

(3) What are the population-related messages already carried by mass media? What do the novels say? The magazines and newspapers? The radio and television? The back of the breakfast cereal box? How do these messages become changed when they enter the personal communication networks?

(4) What virtues and vices are there in linking population control to pollution control in communication campaigns? How do such linkages affect the interpersonal communication processes?

(5) What is the current status of the art of producing procontraceptives propaganda? That propaganda is based on many assumptions about interpersonal communication (see Bogue and Heskanen 1963); what are the assumptions and are they correct for each culture with which we communicate?

(6) In what ways do results of the experiments in social psyc[illegible] fit with population communication research? Do the results on primary-recency, public vs. private decisions (e.g., see Hovland, Janis, and Kelley 1953) and the like apply for populations messages? Do such results apply to interpersonal communication as well as impersonal communication?

(7) What factors affect communication between spouses on population-related matters? (See Hill, Stycos, and Back 1959).

(8) What interpersonal communication factors affect the long-term selective perception and retention of population messages carried by mass media?

(9) Can the mass media be used for more than simply stimulating awareness and imparting legitimacy to population-related issues? If so, how? (See Bogue 1967). How can one use the mass media to stimulate "favorable" interpersonal communication patterns on population messages?

(10) To reverse the variable being studied to the one which is our explanatory focus, we can also ask how population facts affect the communication processes:

(a) How does population density affect the efficiency and types of interpersonal communication that occur?

(b) How does the age or sex structure of a population affect the interpersonal communication patterns?

These questions (and many others) are relatively easy to ask. Specification of the needed research designs is more difficult. Perhaps we should ask our clever fresh Ph.D. to return from his fishing boat? If not, what do the more mature researchers suggest?

I offer no simple solutions. Great questions require great researchers. However, the rest of us may start with relatively pedestrian matters. What is the current status of mass communications in population? What is in our school primers, our newspapers, our magazines, our television and radio? A few careful content analyses of the media would be useful. They contain (often implicitly) messages on marriage, divorce, intercourse, death, geographic mobility, and more. Are the messages in the mass communication known by the people who receive them?

How about other forms of communication? The laws on population matters are a good case for illustration. The population communication messages contained in laws on bigamy, income tax deductions for dependents, divorce, public housing eligibility, maternity benefits, women's rights, and the like should not be overlooked.

In our research designs, we need more long-term panel studies, experimental studies, and a more interdisciplinary effort. We will not succeed in answering the big questions solely using cross-section surveys and secondary analyses of KAP survey data. Neither will we succeed only trying out old ideas in new settings.

It is frightening, at least to me, that so much money is being spent on family planning pamphlets, leaflets, posters, slides, short films, and radio spots while so little money is being spent on research to see how good or effective these devices are. So much of the propaganda currently in use seems to be simply translations from one country to another, all carrying similar messages.

I am also worried because we haven't really tried the kind of intensive and extensive communication campaigns that may be required, and hence cannot assess many uses of communication devices simply because we have never tried them.

To reiterate, population communication is not simply another form of beer commercial. We are talking about basic, important issues when we deal with population communication and I don't believe the "target" audiences will be convinced by yet another beer commercial with a family planning message.

We have to learn more about our talking targets. I suppose we must entice our fresh Ph.D. fisherman to come back to shore and recognize that population communication research is a trying business but it is also a challenging and worthwhile pursuit. The talking targets may "contaminate" neat research designs, but all they are doing, after all, is communicating. That is what our fresh Ph.D. forgot. Rather than measure what the mass media do, he should be concerned with the interpersonal communication stimulated by the mass media. The talking is not contamination; it is exactly the effect one should study.

I do not believe people are targets. They are, instead, communicators who are very active indeed in their communication campaigns. Our research should be directed to understanding the how, what, when, where, and why of true population communication. The mass media or other devices we use should be seen as simply one small input into an on-going everyday population communication process.

I have exaggerated throughout my brief remarks. I hope you will forgive my irreverence. My main point is simple and will withstand some foolishness: people are not targets; they are the population communicators.

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YOUTH AND THE FUTURE OF POPULATION
A PRIORITY FOR COMMUNICATION RESEARCH

by James T. Fawcett

Why should youth have a priority in population communications? And what is the role of communications research? Those are the questions to which I hope to provide some answers. A focus on youth is proposed as a wise strategy from both a population standpoint and a communications standpoint.

Population Reasons for a Focus on Youth

There is no better way to stress the population significance of youth than to cite some facts emerging from demographic research. Consider the following selection of statements:

1. Forty percent of the population of the U.S. consists of persons under 21 years of age.

2. The number of persons age 14-24 increased by 44 percent between 1960 and 1969 - from 27.2 million to 39.1 million - reflecting the high fertility rates of the period following World War II. This current "youth" group represents 19 percent of the total U.S. population.

3. If current fertility rates were to continue, the size of the age 14-24 youth population would increase from 40.3 million in 1970 to 45.4 million in 1980 and to 62.0 million in the year 2000.

4. In the 20 year period between 1965 and 1985, the number of women child-bearing age will rise by 58 percent - the most rapid rise of this kind that has occurred or will occur in the United States during any period of comparable length in the present century.

5. The population age 15-19 will increase by about one million in the next five years and, based on past experience, half of the females in that group will marry before they are 21.

6. Illegitimate births to younger women increased substantially between 1960 and 1968 - from 4,600 to 7,700 for girls under 15, from 87,100 to 198,000 for girls 15-19.

7. A recent estimate is that 33 percent of all first births were conceived outside of marriage and, of these, 45 percent were illegitimate and 55 percent were legitimate.

8. Infant mortality rates are substantially higher for younger mothers - 130 percent higher for mothers under 15, as compared with all other mothers, and 30 percent higher for mothers age 15-19.

9. Forty percent of the population of the poorest nations of the world is under 15 years of age. In the next 10-20 years this huge group will reach their peak childbearing years.

This heterogeneous collection of facts conveys at least a part of the message about why youth are important for the future of population.

In terms of sheer numbers, or in terms of proportion of the total population, youth represents an enormous audience. This is true for the U.S. as well as for the developing countries.

With respect to the future, today's youth are, of course, tomorrow's parents. In fact, many are already parents, but the completed size of their families is as yet unknown. That family size will determine not only the size of the population in the immediate future, but also the potential for population growth in the next generation.

Two themes can be discerned in the facts I have cited. First, there is the issue just mentioned of numbers, or population size and growth. Second, there are a set of issues related to the well-being of youth themselves, as they pass through the childbearing years.

I have mentioned some data about early marriage and early childbearing (legitimate and illegitimate) because these figures say something about the quality of life that will be attainable by many of today's youth. There is ample documentation of the severe handicaps suffered by those who marry or have children when they are young. Too many children too soon is a burden from which a young couple may never recover. Educational prospects for both husband and wife are restricted, earning power is likely to be limited, mobility is curtailed, and so on. Not only is this a tragedy for the couple themselves (or for the parent with children but no spouse, an even unhappier case), but it suggests a deprivation in the home environment that their children will not easily overcome.

So there is both a societal and a personal aspect to concern about youth. Their numbers and the number of children they will have will affect the quality of future life on a national and international scale, and the timing of births and number of children in the family will determine in part the extent to which the parents and their children can share in the amenities of life that are conducive to personal happiness.

Communication Reasons for a Focus on Youth

Before discussing communications per se, it is necessary to mention some distinctions and definitions.

Pregnancies can be defined as wanted or unwanted. The distinction is not always clear, but we can consider, for instance, that most illegitimate births result from unwanted pregnancies. Both wanted and unwanted pregnancies contribute to population growth. Most parents throughout the world want more children than the number that would be required for population stabilization; in addition, people often have more children than they want because of "accidental" pregnancies. The implications for action programs, including communications programs, are different for wanted and unwanted pregnancies.

Let us consider first a highly structured communications context, the school system. Schools in the U.S. have had for some time programs aimed in part at the reduction of unwanted pregnancies, known commonly as sex education courses, or, more broadly and sometimes euphemistically, family life education. These courses

usually include something on contraception, which, along with abortion, is of course a major way to avoid unwanted pregnancy. Another way is through abstention from sex, but I'm told that young people are not too receptive to persuasive communications about that.

It is only quite recently that programs have been developed for schools that aim to reduce wanted childbearing. Known as population education or population awareness, these programs rely heavily upon the communication of knowledge about population dynamics--the connection between family size and population growth, patterns of population distribution, relationships between population and resources, and so on. As suggested by the last item, population education is related in part to concern about ecological relationships and environmental quality.

These school programs are a form of communications and they could profit from the expertise of communication specialists, but perhaps many in this audience are more interested in applications of the mass media. I would like to suggest that this is an extremely important area in relation to population and youth, and that it has been sadly neglected.

Nearly all of the efforts in population education for youth have been directed toward the school system, e.g., development of population courses for various grade levels, discussion of ways to infuse population topics into existing courses, design of teaching aids, and so on. Relatively little attention is being given to means for reaching school drop-outs or to means to continue population education beyond school and through the critical childbearing years of the late teens and early 20's. Here, perhaps, is the distinctive area where mass communications could be useful, in addition to the reinforcing effects that might be provided during the school years. And it is important to note that in much of the developing world only a fraction of the youth population can be reached through the school system, so in those parts of the globe other channels of communication must be used. The growing potential of satellite communications should greatly enhance the possibilities for conveying population messages to youth as well as to the larger population.

A focus on youth is a good communications strategy as well as a good population strategy. Youth represents a definable target population, with all that that implies for audience research, specially tailored messages, selective use of media, and so on. Reasonable doubts may be expressed about the effectiveness of mass media in this area, as discussed below, but surely it remains true that effectiveness will be maximized by a selective focus on a particular audience. From a population standpoint, youth is the audience that should have priority. As to the question of effectiveness, let me turn now to a few research issues that seem important.

Research on Population Communications for Youth

A first aim of population communications is to impart knowledge--knowledge about the reproductive cycle, or birth control, or population dynamics. In this context, there is a need for simple, evaluative research. Which message, from what source, through which channel--etc., etc.,--reaches the most young people, contributes the greatest knowledge, leads to the best retention, and so on. There is no need to elaborate upon this, but such research is seldom done in the population field, for youth or for any other audience.

A more challenging set of research questions has to do with the assumptions underlying population education programs. Put simply, these assumptions are that knowledge will lead to changes in attitudes and values and, ultimately, to changes in behavior. These assumptions are questionable in any context, but especially so when the topic encompasses sex, contraception and family relationships.

It is argued by population educators that their approach is an essential bridge between the values of a free society and the societal necessity to curb population growth rates. According to this view, the best way (or one way) to avoid compulsory or coercive population control measures is to have an informed citizenry. People must come to recognize that childbearing is an act involving

social responsibility, as well as personal preference. This recognition will be fostered by an awareness of the causes and consequences of population growth. In time, then, population education will contribute to a lowering of fertility.

It should be apparent by now that I endorse population education, in the school system or elsewhere. However, I feel also that researchers should take a hard look at the assumptions embodied in this approach. In fact, there is substantial evidence from recent studies that concern about overpopulation is not strongly related to expected size of family. If this is so at the verbal level, as in survey responses, can we expect that actual fertility will be reduced through population education?

From a research perspective, we should perhaps begin by looking for instances where strong relationships do exist. What kind of people, with what information, plan to have small families because they are concerned about population problems? Among the various aspects of overpopulation, which are really salient to young people, with respect to their own future? If we can begin to get answers to questions like these, then we can begin to formulate a communications program that may be effective.

Other questions that seem to fall appropriately within the sphere of communications research are many and varied:

--The vocabulary of population deserves study. Would it make a difference if we talked about couples being "childfree" instead of childless? Is it better to work toward "population stabilization," rather than to espouse "population control"? For youth and for others, what would be the semantic differential responses to "only child" or "big family" or "small family"?

--Consider a content analysis of popular TV programs or teenage magazines or children's readers. What could be elicited about the importance of children in marriage, or working roles for women, or the values related to family size?

--What messages about population and family planning are conveyed to youth indirectly and perhaps inadvertently in our culture, by the concealment of contraceptives under the counter in drugstores, for instance, or by the jokes and rituals that tend to equate parenthood with adulthood, or the patriotic slogans and images suggesting superiority through numbers and material abundance?

Research on topics such as these should provide useful guidance for the design and implementation of population communications programs directed to youth.

Finally, lest I give the impression that youth is to be dissected by the devious tools of the social scientist then manipulated by the allegedly powerful techniques of Madison Avenue, let me emphasize the two-way nature of research on youth in the interest of the future of population. Those of us on the other side of the generation gap may have a lot to learn from the younger citizens who share our world and eventually will inherit it. I am inclined to believe that the new ecological awareness is more than a passing fad and indeed that it presages a shift in personal values that has important implications for population. It won't do to assume that childbearing among youth will closely resemble earlier demographic patterns, when we consider the potential impact of equality in job patterns, when we consider the potential impact of equality in job opportunities for women, greater acceptability of communal living arrangements, an informed awareness of the impact of man on his environment, the coming availability of public day care facilities, a possible lessening of achievement orientations and materialistic aspirations, and so on. These changes, in combination, have demographic implications that are largely unknown.

By all means let us use communications to tell youth what we know about population and family planning, but let us also use research, including communications research, to let youth tell us about the possible future of population.

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RESEARCH FINDINGS AND POLICY MAKING

by David Radel

My main focus today will be on the human problems associated with applying social science research findings to the administration of population programs, particularly their communication activities. I shall endeavor to show that many of these difficulties stem from inadequate communication between the researcher and the administrator/practitioner. This point will be illustrated through an analysis of a common type of family planning research known as KAP studies. Finally, based largely on my own recent experiences, I shall elaborate on several approaches that I see as partial solutions to these problems.

Communication Problems in the Application of Research Findings

In most, if not all, fields the application of research results to practical problems of program design and operation is far from perfect. Many administrators find that the research reports they receive are insensitive to their problems or, perhaps more frequently, they never even see the results of pertinent research in the first place. Both of these can be readily conceptualized as problems of communication.

We all accept that a technical vocabulary promotes unambiguous communication between professionals within one's own discipline, but this very aid to communication can, under other circumstances, be a barrier. Only rarely does the researcher take it upon himself to prepare a second, non-technical version of his research report. Perhaps even more rarely does the administrator feel fully comfortable with the original technical version.

The administrator is normally interested in a research finding only if he has some degree of control over the causal variable. He must also consider whether the difference between the way things are being done now and how the research findings imply they should be done is large enough to be worth the necessary changes in the whole system. Often, then, differences that excite the scientific imagination of the researcher are really not "big enough" to be important to the administrator. An important implication of this is that standards in academic social science research are often too exacting for most applied purposes and hence such research may be unnecessarily expensive if it is being conducted on grounds of its practical uses.

The academic reward system militates in several ways against gearing research to immediate application. "Publish or perish" has become a cliche, but the situation it characterizes is still very real, and one of its outcomes is that the perceptions the researcher has of what is most likely to be published have an impact on what he does quite independent of applied problems that need to be solved. The research methodology and style of presentation currently in vogue are likely to be used even if not the most applicable. For the researcher in a developing country, succumbing to these pressures may make his work even more remote from local problems simply because the journals and audiences for which he is writing are frequently overseas and hence relatively uninterested in his local problems.

The typical university researcher has to deal with other demands that may prevent him from responding adequately to applied problems. Frequently the administrator finds that he needs information quickly, but the university researcher is not in a position, even if otherwise interested, to drop other commitments. If and when he can, he still has a series of other obligations that constantly interrupt his research and slow down progress. Since part of his concern is with teaching the next generation of academic researchers, i.e., graduate students, he normally will attempt to integrate them into the project. It may be an efficient way of producing doctorates, but it often results in the diversion of energy and time from the main focus of the research.

So far I've spoken in generalities. Most of the points I've made can be nicely illustrated in the case of a type of population/family planning research that has been widely conducted around the world in recent years. These sample surveys have come to be known as KAP studies since they focus on fertility and family planning Knowledge, Attitudes, and Practices. According to a handbook prepared by the Population Council, a KAP survey has four major purposes:

> The first is descriptive, in that it sets forth objectively and scientifically what people now know, believe, and do with regard to fertility. The second is evaluative, in that the KAP survey provides a baseline against which later studies can measure the effect of family planning programs. The third purpose..is directive, in that it can provide information profitable to guide programmatic decisions. The last major purpose is validative, in that the KAP study can serve as a validation instrument for the reports of acceptors generated by a family planning program. (3, p. 1)

The widespread interest in KAP research has resulted in the gradual emergence of cross-nationally comparable studies, but unfortunately, as one critic notes, "the now-model KAP instrument is relatively insensitive to unusual but often important conceptions of the meaning of fertility that members of a particular cultural group may share." (1, p. 90) Another, concerned about the practical application of KAP findings, concludes that "the traditional KAP questionnaire does not elicit the specific information which would be useful for tailoring a program for the country." (5, p. 19)

In spite of the facile statement from researchers that the KAP studies are being conducted for administrative purposes, the variables that are stressed in the collection and analysis of data are all too often the "social stratification measure customarily investigated by sociologists and demographers such as social class, education, urbanization, and so forth." (1, pp. 90-91) To the administrator these variables are essentially immutable and hence often irrelevant.

If the findings do have potential application, the researcher often leaves it entirely to the administrator to figure out what it might be. Indeed, the reports of KAP studies are rarely oriented to the supposed key consumers--administrators and policymakers. They usually appear in academic journals or are presented at social science conferences. Sometimes administrators that might use the findings never even learn that the study has been conducted. If a report is submitted to them, it generally has not been written to meet their needs for concise, focused statements. It may contain dozens or even hundreds of tables and be so overwhelming that it is never consulted, gathering dust on the "to read" pile for months or years. Most KAP reports have few, if any visual presentations of the findings through graphs and the like to facilitate rapid assimilation of the main conclusions.

To those of us concerned with the communication dimension of family planning programs, the typical KAP study is patently inadequate as an input for administrative decisions. Granted, questions on media habits are generally asked, but they are invariably too general to be of much use. For example, The International Union for the Scientific Study of Population has put together a model questionnaire for KAP surveys, which for conducting a scientific study of fertility behavior seems to have considerable merit although, as suggested above, its use in its present form may obscure local cultural factors that influence fertility. Unfortunately, but probably predictably, there were no program administrators on the committee preparing the recommendations. The suggested questions on media exposure, for example, simply ask whether the respondent and her spouse usually read a newspaper and/or a magazine, listen to the radio, or go to the movies; in addition there are questions on the frequency of exposure. (6, pp. 56-58 Of course it is of value to the administrator of a communications program to learn, say, that nobody in his target audience has access to newspapers, but if they do, as is likely, then he needs also to know which paper, which edition, which sections, etc. Obviously there are parallel, detailed questions that must be answered in the case of each of the other media before the administrator can decide on the most efficient use of each for reaching his target audiences.

The tremendous opportunity to make KAP-type research responsive to the needs of communications administrators is rapidly slipping away from the social science researcher as new, potentially more satisfactory approaches, such as market research, are being experimented with. I'd like to turn now to those developments and to some other possible solutions of the kind of problems I have been discussing thus far.

Some Partial Solutions: New Orientations, New Roles, and New Contributors

Although the communication of research findings involves two parties--the researcher and the administrator/practitioner--I am strongly persuaded that it is the researcher that must be the more willing of the two to change. I would certainly subscribe to Lakshamana Rao's view that "even as the communication practitioner cannot call himself a professional if he is unable to communicate with his potential audience, the communication researcher cannot call himself a professional if he cannot communicate with his potential user." (4, p. 15) This process can be facilitated through conferences, workshops, and the like. We have, for instance, found some value in a workshop organized along the following lines: First, to set the stage an articulate administrator/practitioner states the problems he thinks research could help solve; then the researchers react to the feasibility of this after which a serious process of discussion and negotiation can occur, leading to a better understanding by all parties of what is needed and what a practicable response to those needs might be.

Having felt some dissatisfaction, however, with such attempts to bring researchers and administrators together, I have become increasingly interested in the development of a new role, that of the "linker," who neither conducts research himself nor administers programs, but has a basic understanding of both and liaises between them. The "linker" would not exactly be a popularizer, but he would read, digest, and pass along to the administrator in a palatable form the findings of the researcher. He would also endeavor to reformulate the administrator's problems into researchable form for the benefit of the researcher. Naturally there are many people who have consciously or unconsciously performed this kind of communication role already in the past, but much is still required to formalize and legitimize it as an acceptable professional pursuit.

From my remarks thus far, you might have assumed that I have largely written off the value of academic research for population communication programs. To the contrary, I feel that in their rush to attempt to assist in the planning and administration of family planning programs, social scientists have often neglected their most important potential contribution--the development of a thorough understanding of the cultural, social, and psychological context in which population/family planning programs are attempting to operate. In essence, my view is that social scientists should focus more on these long run, basic issues and that administrators should encourage the development of complementary contributions from other, heretofore largely unutilized resources such as market research.

The head of a large market research concern in the Middle East argues that market researchers, through the type of research they repeatedly conduct, "acquire special skills in certain areas of research that could be applied to the solution of social problems in the same way that they are useful in marketing. These areas most frequently include basic consumer surveys; attitude studies; motivational research; advertising and media research; product, concept and package testing... and the like." (2, pp. 105-106)

Obviously market research is not going to be the answer to all the administrator's problems, but I would like to run down a list of what I see to be some of its assets to the administrator/practitioner.

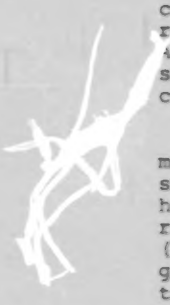
-It is oriented to administrative needs. The major raison d'etre of market research is to collect, analyze, and present data as an aid to executive decision making. Hence reports are prepared for one audience and one audience only--the client.

-It is relatively inexpensive. The standardization and debugging of procedures, a carefully worked out division of labor, and the use of business-like cost-effectiveness measures result in considerably less costly surveys than those undertaken on an ad hoc basis by academic researchers.

-It is quick. The fact that the market researcher is in the business of conducting research with no other source of income means that he cannot afford to be slow in producing the final written report, at which time he customarily receives final payment.

-It is sure. In addition to legally binding contracts, the need to maintain a good image in order to generate new business means that the market researcher is very likely to "deliver the goods."

In family planning, market research obviously has the most direct relevance to the area of information and education, especially public information or mass communication. Over time considerable expertise has been developed in conducting readership and listenership surveys, advertising pretests, and market surveys. All of these have distinct parallels to various kinds of "quick and dirty" research projects that would be useful to the administrator of a family planning communication program.



In Kenya, I have been involved in the use of market research in conducting modified versions of the KAP survey--I've called them KAMP studies, with "M" standing for "media," since they elicit a wealth of detailed information on media habits. The project involved 5,500 interviews divided among about ten audiences ranging from national and provincial elites, through various professions (communications, health, religion, social welfare, agriculture extension) to the general public--men, women and young people. Clients of family planning clinics, their husbands, and dropouts were also treated as separate audiences. The cost to the client, The Family Planning Association of Kenya, was slightly over $27,000.

This was an experiment in bridging the gap between the medically and academically oriented family planners, on the one hand, and the business oriented market researchers on the other. So far it has been a mixed success. The market research company has lost money since it assumed that their new clients would behave like all their previous contacts in the business world. It made the error, basically, of assuming one executive's enthusiastic agreement represented an unequivocal, final answer when, in fact, the decision making process was diffuse and the final decision deferred from one committee to another or from one meeting to the next. In the end the market research company had to assign low priority to the family planning project in order to quickly increase its cash flow from old, familiar clients in the business world. Both parties have, however, come through the experience a good deal wiser and better prepared to work with each other in the future.

And there is much more to be done in Kenya and elsewhere if this kind of collaborative relationship can be fostered. For instance, market researchers have tremendous potential for conducting the kind of pretests of materials that everybody talks about, but nobody ever does. Virtually all of the communication materials prepared in the family planning field are based on the communicator's assumptions about his audience--what the level of knowledge is, what appeals are suitable, what formats and layouts are attractive, what terminology is understandable, etc. Rarely does anybody attempt to learn informally, let along systematically, whether any of these assumptions are correct. The backgound that market researchers have in pretesting advertising campaigns and packaging is very pertinent here.

Other kinds of "quick and dirty" studies for administrative decision making would also seem to be within the purview of market research--such things as testing logos, slogans, and symbols for communication campaigns; studies of the "semantics" of family planning; and perhaps applied research in perception, readability, etc. Market research may even help us get a hangle--at a reasonable cost--on the critical, but long neglected, problem of evaluating the results of what we are doing in population/family planning communication.

Finally, let me point out the potentially revolutionary implication of these developments, for what I'm talking about are some of the first, halting steps to involve in family planning programs expertise and perspective from the commercial world. Eventually this will hopefully lead to the long overdue redirection of basic programming in family planning. The field has been dominated everywhere by a medical orientation, but it sorely needs to move closer to a commercial, marketing approach, for this problem, as I see it, is only medical in an incidental and, hopefully, transitory way. Some of the resources that I'm thinking about are management advisory services, commercial facilities for preparing and processing informational materials, and last, but certainly not least, advertising agencies. (Although promoting condoms may not be exactly like selling Crest, there are more similarities than most present approaches will admit.) Until we accept the need to institute this radical reorientation, progress in family planning programs is going to continue being slow--all too slow.

As a postscript, let me say that in spite of my many caveats, it still appears that the sky's the limit for the contribution of the academic or the commercial communication person to family planning. After all, we're talking about a world-wide movement that is attempting to use information, education, and communication to change some of the fundamental values and behaviors of more people in a shorter period of time than ever attempted before in the history of the world. Let's just make sure our heads aren't in the clouds.

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POPULATION COMMUNICATION RESEARCH AND POPULATION TRAINING PROGRAMS

by Florangel Z. Rosario

By its very definition, communication is expected to establish a "commonness" among individuals in interaction and also among the policy scientists. A need which is beginning to assume a sense of urgency especially in population control programs is that the discovering the most feasible and rapid means of "feeding back" scientific findings to the administrator of action and training programs. There is also a growing awareness that this role of synthesizing, processing and interpreting empirical findings in order that they can be maximally useful to the decision-maker (often labelled "policy research") belongs to the communication specialist. When the latter is often regarded as being a "jack of all trades, master of none," perhaps because of his broad interdisciplinary interests and for having borrowed his theoretical underpinnings from such disciplines as sociology, psychology and social-psychology, he should perhaps underscore the importance of his other discovery of practical application of new knowledge to common problems. Training is one action program which has often operated on common-sense wisdom, not so much because it is suspicious of ivory-tower theorizing but enough for the administrator or trainer whose orientation inclines him to think in less abstract terms.

Population Communication Research and Training Programs

The problem stated above exists in population training programs. It is due to the following reasons: (1) the trainer of trainers, usually from a social science discipline, does not wish to make assumptions about reality based on limited knowledge from available population communication research; (2) the preconceived notion that most trainers or trainees have no appreciation for research and therefore may not find the latter useful in their tasks of administration, diffusion, or programming and production of messages. Both reasons are plausible. The population communication trainer of trainers' task is perhaps therefore to collect, synthesize and interpret these findings with caution, e.g., that they are not sufficiently adequate for making conclusive assumptions about the world. The cross-cultural applicability of these findings must also be examined. However, they provide some basis for structuring approaches to training. In the absence of enough empirical findings, the best alternative to a training approach would be to take existing research findings and add qualitative observations (such as those obtained in case studies) in order to provide basis for designing strategies and content of training programs.

A review of population communication literature would show that the following theories and models have been tested in various locales and that the following generalizations are found to emerge from these studies:

The "two-step flow of communication" model:

The family planning opinion leader (influential) is:

1. Often a satisfied user of birth control.

2. Married, average family size.

3. Open to relevant information on family planning and knowledgeable on subject.

4. Easily accessible to intimates; outgoing.

5. Not highly specialized as family planning leader; exercises leadership in several fields.

The reference group theory ("pluralistic ignorance"):

1. The family planning adopter tends not to act individually; she seeks personal support from intimates in adopting. If she perceives them as rejecting, then she also rejects the idea.

2. A high ambivalence is present because of uncertainty of social support.

Husband-wife communication:

1. Studies indicate that in societies where husband and wife roles are rigidly defined, there is less agreement about family size and less adoption of birth control techniques.

2. Population communication materials which depict peer discussion between husband and wife making decisions about family planning may be unacceptable in some societies.

3. In target audiences where roles are not rigidly defined, messages depicting shared decision-making between husband and wife may promote family planning goals.

Adoption model:

1. Movement from one stage to the next may be slow because of limited communication, technical details of devices, and other psychological barriers.

2. Adoption may be less definite, more subject to intermittent use of discontinuance.

3. For semi-permanent and permanent devices, trial is skipped.

4. "Approver" stage seems relatively easy to create; comes from both mass and interpersonal sources.

5. The "snowball effect" is a covert process because of low visibility of adoption.

6. Adoption may be seen as a threat to the ego because of perceived norms and religious taboos.

7. Motivation among early adopters is high; among later adopters, it is less intense and develops more slowly.

Diffusion theory:

1. The "trickle-down" and "trickle-out" theory may not always apply because diffusion depends on motivations that may be independent of this type of leadership (urban or elite).

2. Diffusion usually starts from those belonging to the higher social class and down to the urban centers.

Personal versus Impersonal Sources:

1. Personal sources are used at all stages of the adoption process.

2. Personal sources may tend to be the first source of information for many potential adopters who are not mass media users.

3. Most adopters are influenced by decisions of intimates after exposure from impersonal sources.

4. Mass media and impersonal sources are known to be effective in counteracting rumors.

Persuasive communications:

As a strategy, the population communicator could:

1. Present only the positive, desirable, risk-free side of Population Control and Family Planning. (May work best with people who already accept the idea, and those who are less well-educated.)

2. Present the positive as well as negative side of utilizing a particular contraceptive technique. (May work best when audience is initially opposed to the idea or when they are better-educated.)

3. Present the threatening, fear-arousing side of Family Planning. (May work best, if message comes from a highly prestigious, credible source. The receivers should also be a more rational, better-educated group.)

Many of the early programs in social change have utilized strategies which have been based on a "cognitive" approach to reality or what Bennis et al (1969) describe as the "rational-empirical" strategy for planned change. This strategy presupposes that certain existing knowledge about human behavior is an indispensable tool for the change agent or anyone involved in training or designing action programs. A typical communication training program in population may have some of the above cognitive inputs, many of which are insights drawn from social-psychological and psychological theories.

A training program which is, however, confined within the cognitive domain may not be sufficiently adequate. This approach uses a general approach to human behavior; there are certain "weltenschauungs" or world views and the basis for action is based on how most people generally behave. A second level, the affective domain, goes beyond this approach and suggests that an understanding of man can only be achieved through the "transactional" process-through constant interaction with the other and basing understanding on personal values or group norms. Bennis et al's (1969) scheme describes this as the normative re-educative strategy.

The transactional approach may be the most feasible alternative inasmuch as much of our existing knowledge about values, habits and norms common to certain peoples have been known to change over time. Within the affective domain, the change agent or trainer starts with certain assumptions about the other but goes beyond that.

A scheme for action would therefore appear like this:

1. Start with certain cognitive and behavioral skills.

2. Develop sensitivity, empathy and awareness of:

   a. the situation (group norms, beliefs)

   b. the interactor (his personal values)

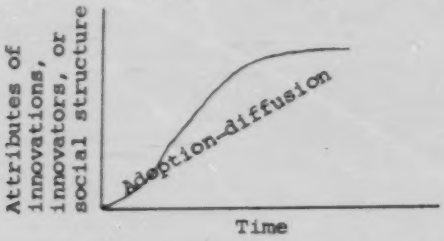
3. Provide several alternatives for decision-making.

A. The Cognitive Domain may be characterized as:

1. Retrospective; static - based on research findings about reality.

2. A "rational-empirical" strategy which uses existing knowledge for prediction and control.

An example of this model as it applies to adoption-diffusion is as follows:



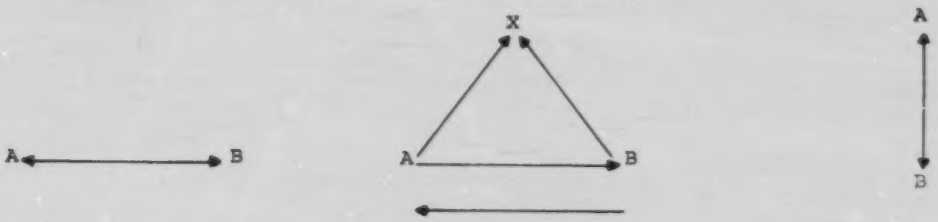
In other words, given certain attributes of innovations and other information on social structure, one can predict the rate of diffusion.

B. The Affective Domain may be characterized as:

1. Dynamic, transactional process.

2. Elements of this model include feedback, consensus, conflict, and collaboration. The interactors in the process are characterized by sensitivity and awareness, interpersonal trust and empathy.

This model has been described in several ways:



3. Focuses primarily on attitude change.

4. Suggests strategies which allow many alternative choices.

C. The Behavioral Domain may be characterized by:

1. The Stimulus-Response model

S ⟶ R

2. Behavior change before attitude change.

3. System of rewards develops attitude change.

COGNITIVE INPUTS INTO THE THREE DOMAINS OF TRAINING*

COGNITIVE		AFFECTIVE		BEHAVIORAL	
Theorists	Theories/Models	Theorists	Activities	Theorists	Activities
Katz-Lazarsfeld Bogue, Palmore	two-step flow of communication	Lewin, Bennis Benne, Chin, Lippitt, Lynton & Pareek, Moreno, March & Simon Freud, Carl Rogers, Matson & Montagu, Welden & Ellingsworth, Deutschmann et al	Group dynamics Simulation games Role-playing T-groups, encounter and sensitivity groups Interpersonal communication International training	Kelman, K. Davis, J. Blake, G. Hardin P. Ehrlich, Hirschman, Skinner	incentives & disincentives; structural means of reproduction control; changes in tax structure; more employment opportunities for women
Sherif & Sherif, Newcomb, Freedman & Takeshita, Palmore	reference group pluralistic ignorance				
Festinger, Kim Stycos, Hill, Bauer, Poffenberger	cognitive dissonance husband-wife interaction				
Rogers, Bogue Berelson, Hovland et al, Schramm	adoption stage persuasive communications				
Lerner, Inkeles, Pye, Rogers, Berelson	modernization				
Parsons, Homans, Argyris	systems				
Rapoport, March & Simon, Neuman & Morgernstern	decision and game				
Fawcett, Ogburn, Fallers, Ryan & Gross	diffusion				
Doob, Sapir-Whorf, Malinowski, Keesing & Keesing, Hall	cross-cultural perception				
Rogers, Lazarsfeld, Merton	homophily-heterophily				

*See Bennis et al for a strategy of planned change, pp. 58-59.

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TRAINING OBJECTIVES IN ACTION
by Huber W. Ellingsworth

"Training" is a term freely used in our society to describe a bewildering array of human activities, including preparation periods for Sunday School teachers, drill press operators, soldiers, postmen, athletes, and business executives. It is also a catch-all description of academic programs not leading to a degree and of meetings and conferences of all kinds. As a result, the statement that a person is undergoing training tells us very little about what he is likely to be doing. It would be pointless to discuss "correct" or "incorrect" uses of the term. Nevertheless, a more precise and restrained use would make possible a more meaningful conceptualization of training and a clearer understanding of training's goals, methods, possibilities, and limitations.

What are some potentially useful constraints which might enable us to separate training from education--on the one hand--and conferences, workshops, seminars, and colloquia--on the other? There are at least seven characteristics which set training apart from similar learning activities:

1. Pre-set Goals and Planned Procedures With Built-in Flexibility--

The cognitive, affective, or behavioral objectives and means of achieving them are carefully specified in advance by those planning and conducting the program. But this does not mean an inflexible commitment to "cover the material" or keep on schedule, as may be the case with education or conferences. Constant monitoring of participant and staff feedback are required, and may point to an alternate strategy or content modification. Thus training is paradoxically highly structured and very flexible.

2. An Appropriate Number of Trainees--

This number is relative to training goals, facilities, equipment, and staff, but it is sufficiently large to develop dynamic or group interaction and small enough for a high level of active participation. Three of four trainees may be too few; forty is somewhere near the upper limit, unless resources allow for the incorporation of dyadic and small-group activities, individual projects, and similar activity-generating strategies.

3. High Interaction Level Among Trainees and Staff--

The program is structured in such a way as to promote activity during much of the training period. The schedule calls for a very limited amount of passive behavior, such as listening to lectures, reading books, or viewing motion pictures. Where input of this type occurs, it is keyed to participative activities such as case study analysis.

4. High Correspondence Between Trainee Needs and the Goals of the Program--

Ideally, the participants in a particular program would be highly motivated from the beginning because they perceive the training as beneficial to them. Those who did not would be identified early and given special attention. Unlike students, trainees are mid-career or immediate pre-career individuals who already have work identities and can relate to training designed to enhance their competence.

5. A Limited Time Period--

Depending on goals, the concept of training as visualized operates most effectively in time periods measured by days or weeks, rather than in hours or in months. The reason for this is the need for a group dynamic, which is hard to achieve in a few hours and also difficulty to sustain and manage over an extended period to time. High interaction and activity in an effective training program drain both participants and staff, and effectiveness and efficiency drop off if the training is extended for more than a few weeks. If the goal involves extensive knowledge change in the participant, an educational format would be more advantageous. Another limiting factor for the training period is that most trainees must clear themselves of on-going responsibilities in order to attend and can seldom be away for long. Expense is also a factor in lengthy programs.

6. A Controlled Environment--

While training is conducted on an in-service basis or scheduled in the evenings after work, the quality of the training will be less than ideal because of distractions, role conflicts, fatigue and other uncontrollable outside demands. Ideally, training will take place in facilities designed and equipped for the purpose, where housing, food service, and recreation can be managed so as to promote training goals and group dynamics and reduce intereference from environmental sources. Some aspects of this ideal environment are often compromised, but almost always at the expense of training effectiveness.

7. A Training-Oriented Staff--

Genuinely professional trainers are a rare commodity, perhaps a meld of heredity and environment. Though training is basically different from education, teachers may develop into effective trainers if they can free themselves of traditional authority-figure behaviors, if they are sufficiently flexible for high-participation situations, and if they can work comfortably in the presence of colleagues. Similarly, practitioners of the matters being trained for can be effective trainers if they can reduce their ego-involvement with the "right" way of doing things or looking at problems. The best staff probably incorporates a mix of "theoretical" and "practical," but everyone will need a clear understanding of the training ethic, which requires their full-time energy and attention, both with the trainees and with each other. The "special lecturer" who appears only for a particular presentation can be a useful contributor, providing the strategy is infrequently used. Ideally, he will develop some sensibility to the group in advance and will stay to see how his presentation was received and assimilated.

To review these seven constraints, they are: pre-set goals and planned procedures coupled with maximum flexibility, high interaction, trainee numbers determined by goals and environment, high salience of program for trainee, limited time period, controlled environment, and training-oriented staff. It may be obvious that these do not describe formal education. Instructional courses tend to be structured by the material to be covered and to stress passive reception of content. Length of instruction is usually determined by independent time measures, such as semesters, terms, quarters, or years, rather than being tailored to learning objectives and trainee needs. Formality is often stressed, and little effort is put forth to facilitate interaction except during class periods. Perhaps most important, formal education is constructed or discreet blocs of instruction called classes. An effort is made to avoid redundancy and the task of integrating the classes falls largely to the student. These considerations operate for both degree and non-degree educational experience, and differentiate both from training.

While training is not like education, it is also different from conferences, seminars, and the like. The goal of meetings is usually to bring persons of similar interests together and provide them with a planning or problem-solving task. Like trainees, conferees function best in a controlled environment, in suitable numbers to promote high interaction during a limited time period. Unlike training, conferencing has no pre-set goals or structured procedures other than an agenda. It is measured by the quality of product and the satisfaction of the conferees, rather than success in bringing about desired changes in participants. Aside from skillful management, staff involvement in minimal.

The point of this discussion so far is to emphasize that training is a unique and important learning experience which deserves to be conceptually separated from other activities. Nevertheless, it is reasonable to assume that for administrative, budgetary, and other reasons the distinction will not be as sharp as called for in these papers. Where the training institution is university-related, training encounters status problems. If the ultimate function of university teaching is seen as degree-granting, all non-degree activities will take a secondary value. Only where a pervasive "land-grant" service philosophy prevails is training likely to achieve its fullest potential.

Training At The East-West Center

In order to reality-test the constraints that define training as described in these papers, we will apply them to the programs of the East-West Center at the University of Hawaii. If the application reveals a less-than-ideal definition, it is only for the purpose of suggesting that training in knowledge, skills, and attitudes could be made more functional if more precisely defined and administered.

The East-West Center is a "problem-oriented" institution which is divided into Institutes of Communication, Population, Agriculture, Culture Learning, and Technical Development. All institutes sponsor candidates for advanced degrees at the University of Hawaii. All also carry on what they describe as "non-degree professional study and training." It is in the classification of these learning activities that some differences are apparent. One institute lists all its learning activities, including degree and non-degree programs as training. Three of the institutes differentiate degree programs from others, but lump non-degree study, training, conferences, programs, and seminars together. The remaining institute classifies by degree programs, non-degree programs and training, plus conferences, seminars, and workshops.

The public statements of these institutes suggest that nowhere is training deserving of special billing. By examining the institute programs and conferring with program officers, it is possible to infer the existence of about 30 activities which fit with varying degrees of comfort into training as previously defined. At least half of the training programs appear to have knowledge as their primary goal. They are at least short-term group activities which focus on topics not readily available through regular University study. Whether the procedures and strategies are those of the classroom or of the training arena cannot be determined in general, but the descriptions suggest that they are "mini-courses" which rely heavily on lectures as the cognitive input. Some titles in the cognitive-goal category are: "Summer Seminar in Population," "Food Production," "Marketing Analysis," "Large-Scale Entrepreneurship," "Population Specialist Training," and "Health and Social Planning."

The second most frequent training emphasis (11 programs) is on skills or behaviors. This includes such topics as: "Techniques of Census-Taking," "Vital Statistics Methods," "Methods of Language Teaching," "Museology," "Marine Technology," "Pacific Islands Radio Seminar."

Not surprisingly, only three programs appear identifiable as training for attitude change, and the sponsors might not agree with this classification. Such programs are: "Seminar in Culture and Language," "Internship in Experimental Culture Learning," "Youth and Community Development Workshop," and "Workshop in Population Communication." From their descriptions, these programs are intended to produce changes in how people view, and relate to, their surroundings, rather than on cognition or skills change.

Dr. Welden proposed earlier in this discussion that all communication training is in the affective domain, though he did not say that all affective training is to produce change in communication behavior. Are we justified in calling the above three programs communication training? Probably we are. In the Culture Learning area, training is undertaken with the expectation that it will affect how people act in intercultural situations. In the case of the Workshop in Population Communication, its descriptions and its two-week duration suggest that people will not acquire much specialized knowledge and skill, but that they will come away with changed or reinforced images of themselves, their colleagues, and their publics which will make them more effective communicators.

In summary, training has been invented to meet needs which education and experience cannot adequately provide for. It resembles both education and experience but is different from either. The primary goal of training may be to produce changes in knowledge, in attitude, or in behavior. Institutions which engage in training could make it more effective by recognizing its unique requirements and opportunities.

MODELS OF COMMUNICATION TRAINING OBJECTIVES

by Terry A. Welden

All training is directed toward the modification of the behavior of the participants. However, not all effort to modify behavior is fairly labeled training, though the ease with which the term training is bandied about obscures the distinction. Answers to the question, "what is training?," are worth considering. The following model evolved from such consideration. With the aid of this model it is possible to differentiate training from other types of training, and to differentiate between a training program anticipated because all large scale projects "need" a training component and a training program envisioned as meeting specifiable needs of the project.

A training program is generally funded because it is believed that education and acquired experience have not provided a sufficient pool of qualified personnel for an upcoming project. Training is often funded out of a belief that it is the only alternative, and thus the label training is attached to whatever effort can be mounted to modify the behavior of involved participants. It should be possible in advance of funding to examine the objectives of a training program and to estimate likely outcomes. If expected outcomes match up with felt needs, then funding decisions are simplified without resorting to the plea, "what else can we do but train?" The many functions of training can be codified through the use of models of training objectives, and in contrast to a general purpose or felt need, they contain specifiable outcomes.

Purpose

If we ask that over-worked man on the street to arrange the following four labels along a continuum, they would likely show up in the order listed: Formal Education - Seminars - Conferences - Training. While he might prefer to overlap them or burch them all together, he would soon utilize a simple theory - to - practice perspective and spread them out as seen above. It can be said that each process underlying each label has as its purpose the increasing of needed goods and services by making more proficient the human components of a production system. Each effort borrows methods and strategies from the others, and it is not useful to attempt a more specific statement of purpose for any of them. Training, by its intensive attack on the proficiency levels of available human resources, is one of the alternatives open to project planners who are interested in increasing needed goods and services.

Model

We cannot differentiate much of anything from the above statement of purpose. Purpose is, however, just one element of a simple linear model of training objectives and it might be well to refer to figure 1. before we continue to define and then relate the various elements. The behavioral domains are the key factors in understanding objectives, and by reference to figure 2, it is clear that priorities within these domains determine the type of training undertaken. This model asserts that the type of training undertaken is a function of the nature of training objectives implicitly or explicitly utilized and not a function of the intent to undertake a particular type of training.

Figure 1.

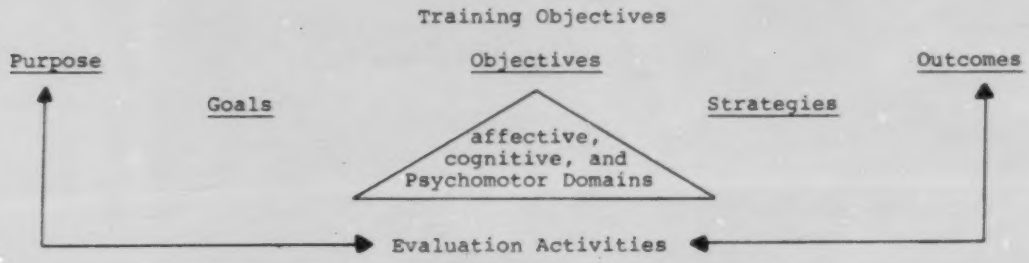


Figure 2.

Communication Training Objectives

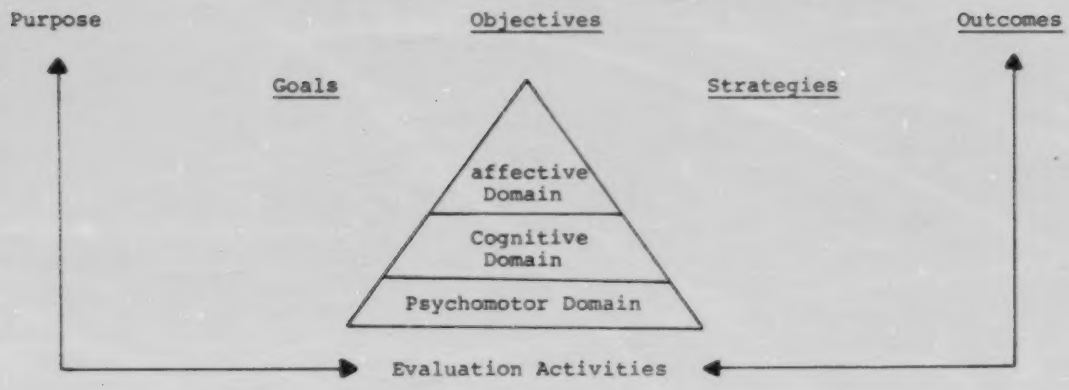
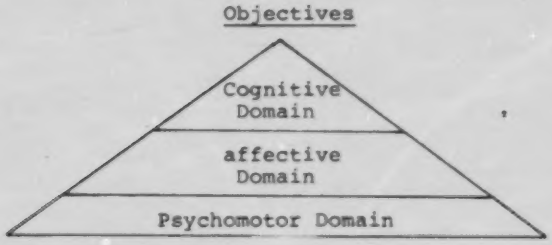


Figure 3.

Knowledge Training Objectives



Goals

Given any formal training effort it is possible to specify three goals that encompass it. These goals, as presented, are behavioral in nature although they give no clue as to what behaviors are involved or what strategies will produce the necessary behaviors.

The first goal of any training program is to increase a trainee's set of alternatives. Through appropriate training he can add new strategies that he may never have thought of or strategies that are infrequently entertained because of skill or confidence deficiencies.

The second goal is to provide the trainee with the criteria necessary to select from an expanded set of alternatives. If the habit of selecting particular alternatives can be shifted to a habit of examining alternative choices in light of appropriate criteria, proficiency (productivity) is increased.

The final goal of training is to make the trainee his own consultant when it comes to adapting existing alternatives to new situations. Training must focus on situations not wholly predictable from the training context, and it is the trainee who must adapt as conditions and/or situations change.

Objectives

To define objectives we can turn to Bloom's Taxonomy of the Cognitive Domain and Krathwohl's Taxonomy of the Affective Domain. While a taxonomy of the psychomotor domain is not yet formalized, it might well point to a counterpart of Evaluation and Internalizing labeled Manipulation: reliable behavior performed at or above criterion level.

Cognitive Domain[1]

Evaluation:	Judgment of internal criteria Judgment by external evidence
↑	
Synthesis:	Derivation of abstract relations Production of plan-pattern Production of uniqueness
↑	
Analysis:	Organizational principles Relationships Elements
↑	
Application:	Particular and concrete situations
↑	
Comprehension:	Extrapolation Interpretation Translation
↑	
Knowledge:	Classifications - categories Sequences - series Specific facts Terminology Recall of information

Affective Domain

Internalizing	(automatically characterizes a way of life)
↑	
Conceptualizing	(organizing a value system)
↑	
Valuing	(appreciation and commitment)
↑	
Responding	(willingness and satisfaction)
↑	
Receiving	(sensitive and aware)

Types of Training

We need only rotate into a position of priority each of the behavioral domains to alert us to the necessary objectives of a particular type of training.

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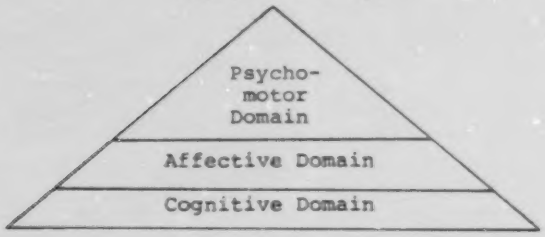
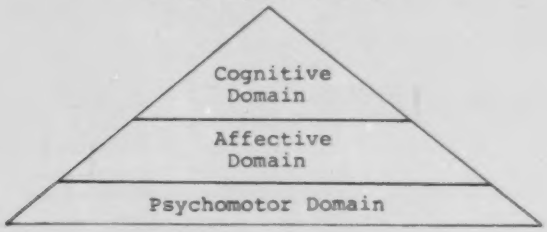
[1] Frank E. Williams, "Models for Encouraging Creativity in the Classroom by Integrating Cognitive-Affective Behaviors," Educational Technology, Volume IX, No. 12, 1969.

Skills Training



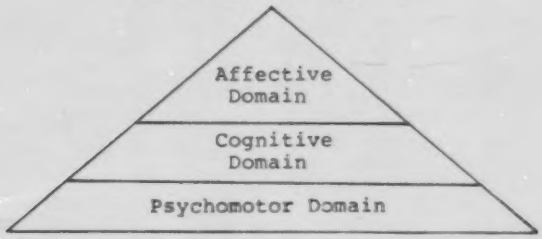
While we will give short shrift to this element of the model, it is clear that much training has as its objective the providing of a trainee with manipulative alternatives. Its priority is psychomotor skills. If possible, we teach him how to evaluate criteria for the application of a particular skill, if not we teach him a skill and supervise him closely. If he can also internalize an approach to appropriate modification, fine: if not we teach him a skill and supervise the environment closely.

Knowledge Training



Knowledge training is easily confused with formal education, and some variant of education is often supplied under the rubric of training. As training, it is undertaken for one of two reasons: either the trainee missed obtaining necessary knowledge in his formal schooling, or new knowledge has emerged since its completion. The objective of such training may encompass the cognitive domain or it may focus on one or more stages of it. It priority is to increase a trainee's set of cognitions. He may be asked to learn certain psychomotor skills in order to have a "better" knowledge of how others working with him or for him must meet their responsibilities, and he may be reinforced in his efforts to internalize his approach to knowledge. In training he may be exposed to the best information available on the need to know more about the importance of skill and affects, but the focus of training is on knowing more.

Communication Training



Communication training occurs under many guises. Human relations, sensitivity, T-group, counseling come easily to mind. The key is in the focus on people relationships, and it is communication behavior that is at issue. The objective of such training is in the affective domain, and where one type of communication training will focus on one level a second will focus on another. To provide a trainee with a maximum set of communication alternatives, to provide him with the criteria to select from among alternatives, and to provide him with the strategies to be his own communication consultant, is to engage the entire affective domain, and communication training seems to be the appropriate choice of label. The role of knowledge and skill in communication training is often clouded because the objectives of communication training are often obscure. The model makes it clear that they are means to an end, and if they become ends in themselves in actual practice it is because trainers do not have the strategies in hand to sustain a communication training effort.

Strategies

The trainer's task is to utilize available training techniques to achieve the objectives established. Any strategies envisioned must be developed within the constraints placed on training, and it is realistic to consider constraints along with strategies. The following list of constraints is meant to be suggestive of a long list of practical considerations that impinge on any training program.

1. Available time and money.
2. The nature of the problem to be attacked through training
3. The size of the trainee group
4. Available facilities for training
5. The social status and status mix of the trainees
6. Available training strategies (state of the art)
7. The training proficiency of the staff
8. The state of development of proposed content

Working within these and other limitations, the trainer evolves, adapts, and "lifts" training strategies. Although quite variable, his strategies can be classed as (a) raising questions, (b) providing models for analysis, (c) creating individual and group tasks, (d) developing case studies, (e) presenting lectures, and (f) manipulating the training environment.

Evaluation Activities

These activities ultimately determine the utility of the outcomes of training. Whether engaged in carefully or carelessly, deliberately or accidently, four stages of evaluation are contained in ongoing training programs.

First of all, training criteria are set. To the extent that goals can be translated into specifiable behavioral objections, the criteria can be tentatively established to fit available time and resources.

Second, training content is developed. Content is here defined to encompass training strategies as well as all contact with participants from the point of initial publicity through any and all follow-up efforts.

Third, trial or pilot efforts are undertaken. This does not imply that pilot efforts are budgeted, just that all training is the culmination of past experience and any initial effort in a new program is a trial in an ongoing learning process.

Finally, programs are revised on the basis of experience. Revised programs may reflect back on earlier criteria setting. Clearly, the revision of content implies effects of earlier stages of evaluation activities.

Outcomes

The product of training is modified behavior. The outcome of a given training program could be an increase of needed goods and services. The rationale for this model of training objectives is that we need a basis for the prediction of outcomes. There are at least two reasons for optimism. First, the recent efforts to stress behavioral objectives in education, schooling, and training dovetail with the approach taken here. Mager[2], of course, should be the first stopping point of any planner. McAshan[3] supports the integration of goals and performance objectives. Canfield[4] provides the trainer with an approach to supplying the trainee with a rationale for each objective specified in a program. Together, monographs such as these follow an adequate test of the model, and that brings us to the second reason for optimism. The model appears to fit the criteria of a refutable taxonomy. The elements defined can be redefined, and the priority arrangement of objectives can be matched with an actual list of objectives for a given training program. If it withstands the tests in some recognizable form, it is a useful approach to the question, "what is training?"

SOME SUGGESTIONS FOR THE TRAINING OF DEVELOPMENT COMMUNICATORS

by Sanford Danziger, M.D.

It is only recently that the great need for more and better communications inputs into international development programs has been recognized. Following this recognition, though by no means universal among administrators, there has been concern for how to prepare the people who will do the planning, production and evaluation of communication inputs.

Since the training of such personnel, especially in family planning, is a relatively new field, it may be useful to present here what may be some partial solutions to problems encountered. The following suggestions are not meant to be inclusive. They are based on experiences in the short-term training of administrators and practitioners of rural development (often family planning) communications.

Prepare a Complete Syllabus, With Clear Goals and Methods of Training

Obviously useful in any course of study, but especially for communications training. Administrators, often skeptical or uninformed of the purpose or methods of communications, can see in advance the specifics of the training their subordinates or practitioners are going to receive. The administrator can, in addition, make meaningful suggestions to the trainers when he has such a document. All this tends to provide more administrative support for the trainee once he returns home from training. Lack of post-training support has been a traditional problem in communications training. Further, careful documentation of the training program can help the administrator, and returned trainee, define the job of the communicator. In these ways, training can actually affect and help programming in the field.

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[2] Mager, Robert F. Preparing Instructional Objectives. New York: Fearon Publishers, Inc., 1962

[3] McAshan, H. H. Writing Behavioral Objectives. New York: Harper and Row Publishers, 1970.

[4] Canfield, Albert A. "A Rationale for Performance Objectives," Audiovisual Instruction, February 1968.

This syllabus provides a quick and effective orientation to the frequently-invited lecturers and hosts of field trips, and in general provides a common language and goals between the client institution (administrator), training institution (trainers) and trainee-participant.

In this new branch of communications training, such a document, with clearly stated objectives and methods, will be very helpful to trainers just beginning in other places, and especially to the returned trainee if he is going to conduct his own training programs. In many cases, he is.

De-emphasize Lecture Methods

Especially in training those who will later be associated with interpersonal communications training. If not, the method will be passed on to the village level where lectures are especially ineffective. People usually teach in the same way they are taught. In family planning, the classic examples are the complicated anatomy lectures being foisted off on village women by field workers. The latter were taught by physicians who were in turn repeating their medical school lectures.

On the other hand, innovative, creative programs to train rural communicators can have spin-off benefits beyond family planning communication, and can influence agriculture extension, health education, teach training, etc.

Train With Appropriate Tools

Only on or with those now or soon-to-be available, serviceable and practical "back home." To do otherwise tends to demoralize those trainees who realize the problem and builds false enthusiasm in those who don't. For example, "Is film really worth spending 'X' amount of time learning--especially if it's at the expense of radio?" Videotape is truly remarkable as a feedback method for role playing, but if it won't be available back home, why not use other feedback techniques. Otherwise the message to the trainer becomes, "You can't teach or do this at home without a _____."

"Package" Communications Training

As communicators, we should be prompt to evaluate, then package our training courses in the various media so as to help trainers in other places--including our ex-participants. The idea, of course, is for the package to be "adapted" to the new situation rather than "adopted," untouched.

Learn From Other Areas

Avon Cosmetics and Fuller Brush can teach us things about selecting and training home visitors and field workers.

Turning from the process of training to its content, I would offer the following suggestions.

Train to Use Radio

It reaches the rural areas of developing countries where the great majority of the people live. The software for it is relatively easy and inexpensive to produce, given existing and projected personnel and resources. Yet radio is still very underutilized. Trained and creative people are needed to demonstrate its potential. Last month Wilbur Schramm wrote, "In the seventies the basic channel for rural development and out-of-school education, and I suspect, family planning, is going to be radio... I hope we can help the new countries to make full use of this mature and inexpensive technology before rushing into higher-priced and fancier electronics."

Emphasize the Training of Trainers

There is a great shortage of development communicators in the developing countries. A way to fill this large gap is via national and regional training centers staffed by competent trainers. Knowing this, many countries are requesting a "training" input for the people they send abroad to learn communications. Administrators also can benefit from a knowledge of training goals and methods. They are thus more comfortable suggesting, supporting, and evaluating their own training efforts.

Provide Evaluation Components

Communications training has seldom emphasized evaluation. If this were reduced to a basic minimum, it should include the knowledge and skills to do competent pretesting of materials, as well as an appreciation of its importance.

Emphasize a "Receiver" Orientation

A suggestion for the overall tone of a training program is to strive for an orientation which asks: "Who are the audiences, and what do they want to know?" This is contrasted with a producer orientation which asks, "What will I say, and how?"

Present Relatively Small Amounts of Theory and Research Findings

If and when presented, they should be accompanied by significant, concrete implications for program design and activities. Most all trainees come to training seeking practical information which can help them to solve their most pressing problems and to make rational, effective program plans.

III NEW COMMUNICATION TECHNOLOGY AND SOCIAL NEEDS

PREVIEW

Communication technology of the future is here but the ability to define the social and communication needs to put the technology to work is not here. The technology has not only outrun the ability of the social scientists to formulate needs and means of meeting the needs, but technology often generates its own system in the vacuum--a system that may not meet the communication needs of society.

How to put together social needs and communication technology is the thrust of the papers in this section. Many needs have been identified for health, education and welfare communication. Such communication is often uneven, incomplete, and costly. Mr. Horley notes in his paper the recent developments in (1) communication satellites (2) cable television (3) audio and visual recording and (4) computer use in information storage and retrieval, and cautions that just because the technology is being developed doesn't mean "it will be effectively utilized to meet the real or perceived needs of individuals."

Far better communication will be needed between the technologists and the social scientists and the users. Horley notes the technologist will ask how many television channels do you need, and the users often don't know if they want television or other kinds of communication systems. The communication systems will develop, one way or the other, with or without the needs of the users specified, Horley warns. If we are to influence the shape of the system, we must identify the needs and specify the technology to meet those needs in an appropriate way. This is truly a crisis in communication. Once the system and technology is in, it will be difficult to either change it or put in new systems.

What are some of the social needs? And some of the principles for communication systems? Some of the answers are given in the papers, others will have to be identified. The papers specify, for example, the diversity of communication needs, the need for two-way communication or "talk back" capacity, the need for low-cost and easy to operate systems, and the need for problem-solving communication systems.

There are practical applications of combining social needs and the new technology. In the next few pages are mentioned the needs of family planning, education and literacy, biomedical and bibliographic services, early childhood development, and career planning. The Alaska and Pacific projects are in operation, and based on the needs of the users, not of the technology. These are but among the first steps of the potential. Dr. Andrus says "there is a communication dilemma at all levels," and more engineers and more user people are going to have to learn to understand each other before the needs can be transformed into technology. Dr. Andrus notes that NASA, in seeking needs, goes out and talks to people, and encourages experiments such as the Alaska and Pacific projects.

The Pacific and Alaska experiments faced many similar conditions--communication coverage of vast, empty areas with small, scattered populations, difficult transportation, lack of education, communication, medical and other facilities. Alaska is big--but dwarfed by the vastness of the Pacific. All this is pretty well neutralized by the distance-eliminating satellite system, however. The two experiments also deal with cross-cultural communication, and in an area of scarcity of information.

The needs seemed fairly obvious--there was inadequate communication in areas of vital human concern--education, medicine, news and public affairs, and cultural understanding.

Priority was given to the needs, not the technology. "We attempted to assess the social needs of the area and then say what kind of a system will work and we came up with PEACESAT," Bystrom says. Costa's paper notes there was little in the way of assessing telecommunication educational needs. To tackle problem solving, the system links institutions of higher education and provides backup professional support. In developing a principle mentioned by Andrus as well, Bystrom said the system had to be low cost and easy to operate so it would be two-way, not one-way mass communication. Cultures could listen to each other, despite differences in economic development and access to sophisticated communication technology ("information imperialism" is a term that is being used seriously in developing countries).

Professor Nose is the man who came up with the low-cost, easy to operate technology for PEACESAT, and his paper describes the constraints on and techniques for developing low-cost transceivers, suited to the situation in the Pacific.

Both the Alaska and Pacific systems had difficulties in projecting use in areas that really didn't have this kind of communication before. In telecommunications, Northrip says, it is "difficult to forecast a demand for such a service before the service exists." Northrip also says that commercial communication carriers must see a way to make money before they will go in. "Existing common carriers by their very nature...are going to present some problems to us if we intend to try to use the new technologies to meet some of the needs around us."

"With the technology we now have," Stanley says, "we can put good communications into the remote areas if we have enough money, enough time and can handle the regulatory problems."

Technology not only can be used to meet existing, recognized social needs, it can affect social needs--generate new ones and eliminate old ones. Not all of the needs, of course, need to be determined before a system goes in. One of the Pacific experiments, for example, is based on the need for more news and public affairs about other places in the Pacific. How to go about that is a second-level need determination. So this project uses the PEACESAT system to link editors from around the Pacific in a planning session for news and public affairs programming. This permits interaction not only in the programs but in the determination and planning of programs.

Bystrom, in assessing the needs of the Pacific, felt that cable communication was out of the question in most cases. The expense involved is too great for widely scattered, low population and low commercial interest areas. He not only developed a system for many of the needs listed above, he has in many ways demonstrated how to break the traditional patterns of international communication.

The PEACESAT system, for example, is two-way, interactive. It lets the developing area interact directly with the developing area, it deals on a basis of equality in technology--everyone has a $1,500 transceiver. The rules of the game are that anyone can talk and anyone can listen, but nobody is required to do either. Information and news traditionally flows from the developed to the developing countries. PEACESAT offers as a positive attraction the opportunity to listen to another culture (Adlai Stevenson's hearing aid on an international scale). "We felt that this was essential," Bystrom says, "that cross-cultural communication does not take place when there isn't dialogue and two-way communication."

Another lesson from the Pacific and Alaska experiments is that to get a true dialogue going there must be near parity of technology--otherwise the more advanced technology will overwhelm the less advanced one. This applies in many ways to the programming aspects, too. "We are not trying to be too professional," Albert Hanley, with PEACESAT in Wellington, said elsewhere. If professionalism was the standard for PEACESAT programming, the more advanced countries could become dominant. This same principle can apply to local programming over CATV and video cassette centers. This doesn't mean advanced or sophisticated

technology can't be used--but it must be low cost and relatively easy to operate.

This is still the part that is unresolved--how to develop the software for the system, how to create the conditions where not only the participants are on an equal basis in technology but in programming as well. Again, perhaps the second-level use of PEACESAT is to develop programming ability as the system grows.

A wide range of program activity was taking place on the satellite, in an effort to demonstrate its capabilities for Alaska and the Pacific basin. Out of them was emerging the system for determining needs and the means to meet them.

Chief Adebo examines the dual communication role of the United Nations--it has internal communication and tries to develop world systems of communication. He says that decreasing communication, clearing the channels, is sometimes as important as increasing the flow of communication. The need for such communication via satellite in the UN's role of peacekeeping is described.

The papers that follow fit very well into the neo-Lasswellian framework, especially the PEACESAT system, with its emphasis on two-way, interactive, everyone's in the game concept. Communication technology clearly can give us what we want, but we have to know what we want. It is a world of the participatory society, two-way communication, sharing the right to tune in and tune out when you want, mutual exploration of needs and anticipation of future needs, the emphasis on seeking out the needs of the user, not the communicator.--J.R.

SOCIAL SERVICES AND NEW TECHNOLOGY
by Albert Horley

I have two principal purposes. The first of these is to convey new information to you in terms of interest and programs of my particular agency in the Federal Government. The second is to discuss a process of problem-solving involving communication between two rather different kinds of communities: a technological community that develops the means and mechanisms of communication; and, a social problem-solving community including sociologists, psychologists, educators and health personnel who deal with those problems that affect humanity. The main area of my interest and endeavor at HEW lies in trying to find a way to bring these two communities together.

First off, the principal areas that we are concerned with are health, education, and welfare. The kinds of problems that we have in these areas can be categorized in three ways. There are problems of the quality of the service that is provided. Very often we find that it is uneven throughout the areas in which it is to be provided, and very often it has been deemed inadequate whether it be health service or educational service or public welfare service.

Secondly, the coverage of the service is not complete. There are many segments of population which are isolated geographically or socially. For these reasons the coverage of services are not uniform throughout the country.

Finally, we find that the per capita cost of delivering these services is very high. This is largely because these kind of services require high skills and are very labor intensive. Medical services and medical doctors are high cost services. In education, quite skilled people are required. Until now, the techniques of delivery utilized in this country have been extremely labor intensive and very susceptible to the forces of inflation. We began to explore possible ways that we could evolve new systems of delivery for the health and education and welfare services of the country that would take advantage of the technological capabilities of the country and in the end result in lower per capita costs overall for the service.

That very concept of cost has caused problems for many in the Department because many of those who have spent a life engaged and dedicated to provide

such services consider that any reduction of the per capita cost reduces the quality or some other affective feature of the service they are providing.

Some of the technological developments represent a great promise because of the deficiencies of the health and education and welfare services. Basically, we have four major technological developments occurring for different kinds of technology that can have a major impact on these services.

One is the communication satellite technology. To some of you it may seem that this is a very new technology and, in some ways, it feels to me to be a very old technology. In 1958 I was working for the Rand Corporation and conducted one of the early studies on communication satellites and their use for education. I've been waiting for a long time to see any use of them for education and, for that matter, for very much else. It's a great deal older technology than its application would indicate.

Secondly, cable television which is a broadband wired system is going to come into place in the next 10 to 20 years in a major way in the United States. It represents a whole new capability of communication of broadband circuits direct to people's home which is a considerable extension of the present telephone system.

Thirdly, the recent developments in the field of recording, video recording and audio recording, cassette video tape recorders, video records, the whole group of technologies that are associated with the storage of both visual and sound information have come a long way in the past 10 years and promise to move even a greater way in the next 10.

The fourth one I would add to this list is probably not considered to be a very new technology today but its interrelationship to the other three is very important. Computer technology is in its fourth revolution of reduced size and cost. Summed up together over the next 15 to 20 years, these four technologies are going to represent a whole new level of ability to store, access, communicate and distribute over the country and the world enormous amounts of information.

The fact that such technology is being developed in no way assures that it will be effectively utilized to meet the real or perceived needs of individuals. In fact, even our ability to perceive those needs in some ways is influenced by the kind of technology that we have at our disposal.

I have been engaged in a number of studies within the department and between agencies of the Government in attempting to look at how one applies this technology, and the thing that struck me most is the very great difficulty of obtaining communication on a simple person-to-person basis between the technical community and the medical community or the educational community. The technical community will ask for a set of requirements: How many channels do you want? How many video channels are needed between Oshkosh, Wisconsin and Washington, D. C.? How many regional centers need to be connected with how much teletype capacity? The response very often is that we don't even know whether we want educational television or any kind of communication. We haven't been able to sufficiently define the problem to know what kind of technical capacity we want.

The great tragedy of this situation is that in fact we have perhaps for the first time in history a chance to dramatically influence how the physical plans of the communication industry of the United States will be developed over the next 10 years if we can articulate the statement of social needs in such a fashion that it will deliver needed services. If we don't develop a dialog between the technical community and the social problem-solving community, we run the grave risk of having considerable private and governmental investments made in communications capabilities which will only transcendentally serve to help education and welfare needs of the country. The commercial interest, the security interest of the country, by contrast, succinctly defined in terms that can be translated into technical capabilities.

I would now like to turn to the business of providing a bit of information about what HEW is doing and is planning to do in terms of addressing this problem. Clearly we have two aspects of it to deal with. One is influencing the development of a commercial or a government run communication system. We will do that primarily through the policy channels of government. We have already, on a number of occasions, gone before the Federal Communications Commission to present the views of our constituents--the health community, the education community or the social services community--with respect to such issues as cable television and domestic satellites. But in addition to examining those questions related to the technical system, we are very much concerned with what other service is going to be provided over the system and the principal ingredient that has been missing is the lack of program material.

To remedy that absence we are involved in funding such things as Sesame Street and the Electric Company. The Office of Education is presently finding these two program development efforts at the level of about seven million dollars a year. We intend to continue this and to extend our interest in that area to begin to develop bi-lingual programming. We're beginning to recognize the diversity of needs of the country. Children's programming in Spanish, but eventually perhaps other languages, will be considered. We are at the present time working with the public television service developing a series on population control, an area of responsibility to the public health service.

We also will become involved in programming dealing with career education and following that, move into areas such as high school equivalency and basic literacy. The medical community has funded a number of projects that are related to services, many of them are very exploratory at this time. We do have a biomedical network and the bibliographic services of the Library of Medicine which is available all over the country. These are all just a very rudimentary beginnings of the kind of services the department hopes to see developed and evolved utilizing communication technologies.

We don't really expect to spend a great deal of money on the technology itself. Our feeling is that commercial communications interests of the country have enormous capital which they can and are willing to spend to develop new extensions of the communications system. Our job really is to help state very clearly the needs in terms that can be understood and acted upon by the communications interests of the country. Therefore, what we do is attempting to develop totally viable packages of services which make use of the most modern communication capability. We will be concerned not only with the development of the program materials such as the Sesame Streets and the Electric Companies. We will also be concerned with the services that must surround such a program material to make it a totally effective package for education or for welfare or for health.

One of the key areas that we could address is higher education. Right now, less than 50% of the people who graduate from high school go on to a higher ducation in the United States. The demand is continually increasing and the cost of higher education in the United States and elsewhere in the world is continually increasing.

There have been a number of experiments conducted elsewhere--in Japan, in England and Germany--in developing an Open University. The department is examining a number of possibilities in this area. We have hundreds of studies that have been published by the department such as the Newman Report. It is possible that we would consider in the next fiscal year some beginning of feasibility and conceptual design studies for such an Open University.

We will continue our work with early childhood as we feel this is an area where there is a great deal of opportunity. There really wasn't a great deal of recognition as to just how important the early years of life are. A rather sophisticated delivery system is required for child development services, not only to the children themselves, but to the parents of those children and to those professionals who may work with children in such places as day care, perhaps coupled to the notions of women's liberation and other similar matters in this country.

We are looking at ways that telecommunications could extend the capability that does exist in the country and enable those with less professional experience to, in fact, build their very valuable roles in helping the children in terms of total development. We are going to be involved in career education as I said before, and this together with the early childhood is going to form the principal basis for an experiment primarily in the Rocky Mountain region of the United States in which we intend to make use of the NASA ATS-F satellite beginning in 1973. We are using that satellite as a vehicle of delivery. We intend to develop services in both career education and early childhood. The career education services will be concerned with providing material to children in school--6th grade through the 12th grade--which gives them some perception of the kinds of opportunities that might be available as adults to earn a living.

Those that are at the point of graduating from high school need to have rather direct information with respect to where the opportunities exist. And finally, there are some segments of the program which are involved in actual skill acquisition.

TELECOMMUNICATIONS DEVELOPMENT--INTELSAT AND BEYOND

by Dr. Greg Andrus

In developing our programs, we encounter problems in obtaining the information necessary to make certain that the technologies that are going to be developed will, in truth, be the kind that people will need and want to use. That is a tough problem because often-times the user-community, which may be the education community, the medical community, CATV operators, or broadcasters, is unable to specify its needs. If it were possible for them to tell us in very precise engineering terms how many channels of teletype facsimile, TV channels, TV talk back, or radio channels are needed, our task would be simpler. The reason why we need to approach it that way obviously is because we understand the terminology ourselves and we know how to design systems to match those needs.

The dilemma, however, is that members of the user-community, whoever they might be, do not understand that kind of terminology and they are not even sure that they want TV, if it is TV they are asking about. There is a communication dilemma at all levels. This is the reason why I think more engineers and more user people need to have a dialogue going and talk things over. This is an iterative process and it does not occur at just one session; it has to take place over a period of time and over numerous meetings whether they are across the conference table or while having a drink at the local pub. What I would like to do is go through and give you some insight as to what our objectives are, how we go about these programs, and tell you about the technological opportunities which exist.

Under the Space Act of 1958, we were given the responsibility by Congress to try and improve the usefulness of space vehicles to serve the needs of mankind. In order to do this, we had to conduct some long-range studies to examine what these potential benefits mean in terms of economics, social impact and so on. One of the roles that we had earlier was to engage in international cooperation so that not just the highly industrialized rich nations like the U.S. would benefit from it. A very important aspect is to maintain very close cooperation among all the interested government agencies, like HEW, for example.

We're not a user. We have no responsibility for health and education welfare or the delivery of social services, but our technology may help with some of the solutions to those problems. As the communications satellites became more of a reality, the Communications Satellite Corporation came into being under the Act of 1962. But we still have some responsibilities to advise the FCC on technical characteristics of the systems which are being proposed to us. But now we consult, and we cooperate with COMSAT, and we launch their satellites on a reimbursable basis. We advise the Department of State on matters having to do with frequency allocations and implications of those allocations for international communication.

What is the sequence of events that we go through in trying to plan out our program? First of all, we do have to pay attention to needs. We cannot develop a program in a vacuum. We go out and talk to people and then we try to assess the applicability of space technology to meet some of these potential needs. Then we develop the technology, we flight test it, we conduct experiments in orbit, and provide opportunities for those people who have an interest in carrying out experiments using satellites to find out about their operation and learn whether this mode of communication is really worthwhile before they make huge investments on their own. It gives people an opportunity, such as on ATS-A through G, to get experience, to find out about feasibility, and to validate questions which they have in mind. And this means considering the user's requirement. Once they have done some experimentation, they are in a better position to address the problem of requirements. Maybe not in technical terms but in their terms.

In the meantime we have learned to converse and communicate with each other and information gained in this way is fed into further system requirements and concepts and testing satellites and free operatonal power programs. The evolution of some of the NASA programs show benefits to the taxpayer in the form of spin-offs.

In the early days, for instance, we did a number of experimental assessments of a large balloon and we learned quite a few things about that. First of all, we learned that it was not a very good communication medium but we learned an awful lot about the transmission of information to and from orbit. We learned about characteristics of ground terminals and operational problems. This technology enabled the early introduction of commercial communication--the first being the establishment of the "Early Bird" satellite over the Atlantic at 22,300 miles above the equator. Since that time, there has been a whole series of satellites called Intelsats and we now have in operation a global telecommunication system. This has resulted in some benefits to the people who use the telephone. It used to cost $12 for three minutes to call across the Atlantic and that has been substantially reduced now. We have had the application technology and satellites which we have talked about as ATS-1 and ATS-3. These satellites have been used not only to develop technology, but in providing a test bed for a number of user experiments. Alaska does public broadcasting to its people. There is an experiment between Stanford and Brazil which will start soon.

Our program is shaped, to a large extent through user's experiments and user involvement. We try our best to stimulate the user's technical application. The growth of this user acceptance and demand, of course, is going to have an impact on how to control the build-up of the application and we can accelerate user acceptance through experimentation. In some cases, of course, the private sector as it did in the case of the Intelsat global communication systems picked it up so they could make money. The Comsat stock was originally issued at about $20 a share; it is $65 on the stock market now and they thought that they would not have to pay dividends until 1970 or 1972 but they started paying much earlier. It was a very worthwhile profit-making situation. We have an opportunity to expand a user community through system demonstration and encourage and publicize our user experiments. In other words, once these satellites are put in orbit, it gives you a real opportunity to make use of them as a test bed facility, a public facility. You get some time out of it; it does not cost anything to carry out experiments. Agencies like HEW, Department of Transportation, Department of Commerce, Department of Justice, Office of Telecommunications Policy, Corporation for Public Broadcasting and National Educational Association have done so.

We have a new satellite going up in 1973 and another in 1975. It has a very large antenna 30 feet in diameter, and weighs about 25 pounds. It is a complex space craft. It will be put in syncronous orbit and will be able to point to any geographical area, if one wishes, to within a tenth of a degree and carry out a number of experiments such as educational television. Once the antenna has been deployed, then we can lower the booms down and the final configuration points directly to the surface of the earth.

The experiments which we will be carrying on the space craft will cover a wide spectrum of experiments ranging from meteorology, to navigation traffic controls, to communications for over ocean aircraft, to make flying safer for for the general public to use.

We are conducting propagation experiments with radio frequencies which are much higher than normally used in communications now. The spectrum is an international resource. It is scarce. So one has to look for other areas of the spectrum so that once the available spectrum is used up, we will know whether these other portions of the spectrum will be useable and how they might be used.

On the ATS-F satellite we have a scheduled bench mark experiment with India that tests the ATS-F and its coverage area in the Indian Ocean. They have a ground station that was built for them under United Nations funds. That station will be used to transmit Indian program material up to the satellite. In other words, we have nothing to do with the generation of the programs, the instructional programs which will be used by India for the period of one year. We are committed to them to use the satellite for that time for approximately 4 hours per day. And then the satellite beams down to the entire sub-continent of India. Now, approximately 5,000 villages which have been selected will have TV installations and the Indian program will be designed for such things as family planning transmission to adults and teaching new ways of producing crops, using new hybrid seeds and fertilizers to farmers in villages.

We had to fight hard for them to obtain the frequency in the 2,500 and 26 megahertz band which is called the ITSF band. We had a very difficult time trying to get those allocations agreed to, not only in our country but when we got to the World Administrative Radio Conferences in Geneva last summer, a lot of people were quite opposed to it.

So we are looking at alternate ways, because we know the present band widths are not going to be enough even though people cannot yet tell us how many TV channels that they need. We suspect that government agencies, professional agencies, and conferences of all kinds, instead of having just a few people in a room somewhere, could be taking place all over the world. Eventually, we will wind up with 3-D TV. An information network might connect schools and hospitals and the Medical School auditoriums, the national libraries, and other organizations. These are developments that will come soon.

THE ALASKA PROJECT: COMMUNICATION TO THE VILLAGES

by Robert Arnold

In order to talk about the telecommunication needs in Alaska, and about how satellites may figure in meeting those needs, it is necessary to tell a few things about Alaska. The state is over a half million square miles in size; east to west is a distance of about 2,000 miles, and from southeastern Alaska to northwest is a distance of about 1,500 miles. The state is as large as the 19 most eastern states of the nation. Our population is scattered into about 270 communities. Anchorage is the largest city in the state with a population of 124,000. Some 60,000 to 70,000 persons live in 5 or 6 additional communities, and the remainder of the population is in remote rural communities which have a median size of 150 people. Most of these rural communities are of Eskimo, Indian, or Aleut villages.

In the cities, our principal problem with communication is one of trying to get a telephone circuit to one of our other communities. Half of our communities have no telephones. The communities which do have are probably served by too few long distance circuits. We call to the lower 48 and to Hawaii or elsewhere by submarine cable, by going down the Alaska Highway by microwave, or by satellite. Comsat has a new station about a hundred miles north of Anchorage, and about a third of our circuits outside are through that earth station.

Except for once or twice a year in the larger cities, real-time television is unavailable. In the 142 rural communities having no telephone service at all, villages must rely upon short wave radio, which in some locations or under certain conditions is not reliable at all. These communities are native villages--most of them Eskimo and Indian communities. The way of life is largely a combination of food gathering, combined with seasonal employment or welfare. The importance of communications is underscored if you know there are no roads to most of these places. Perhaps four or five of the states are connected by a road to any other place. In all of western Alaska, there is only one road, between Nome and Teller, a distance of 80 miles--and this is a quarter of a million square miles. A few communities are regional centers with populations of 2,000 or so. In one they are building an educational television station and in another an educational radio station. One, a southern Eskimo community, the other a northern Eskimo community. There are, in these rural places, enormous health problems, high infant mortality, virtual absence of jobs so that unemployment problems are very high. The educational programs have long existed but they have been less effective than those of the cities for a variety of reasons. Another striking thing about Alaska is the scarcity of information, whether health or public affairs or education.

Telecommunications technology promises to help meet the problem of scarcity of information, to help meet the needs of rural Alaskans for education and improved health.

THE ALASKA PROJECT: COMMON CARRIERS AND SATELLITES

by Charles Northrip

I'd like to first touch on our common communications carrier in Alaska, RCA Alaska Communications. RCA Alaska Communications recently bought the system from the United States Air Force, which ran all the long-line communication in Alaska for many years. RCA, though, is typical of any common carrier--it has taken as its model other common carriers and is attempting to do in Alaska the kind of thing the common carriers are doing all over our country. They make their money on a percent of the investment they have in the equipment.

One of the things inherent in the common carrier problem is that they can't render services to us for which we can't pay. They're in the business to make money. And yet one of the funny things about telecommunications is that it's very difficult to forecast a demand for such a service before the service exists. One good example of this, is AM radio. In the early days of AM radio, many non-profit institutions, primarily universities, began AM radio stations. Very few commercial enterprises got into the AM radio business until somebody figured out you could make money at it. As soon as that happened, most of the universities strangely got out of the AM radio business and a lot of businesses got into it. The same thing happens with regard to telecommunications today.

Our traditional approaches to doing whatever it is we want to do are generally geared to the means that we have at hand. An example of this is radio programming today. You simply do not, if you are a radio station manager, plan to do any kind of high fidelity broadcasts over the long line system of the country because you can't get the necessary band width to do a good job. Therefore, it is very difficult to talk about what the system demands are going to be. RCA, like any other common carrier, is reluctant to get into this kind of business--via satellite or terrestrial means--unless they have some means of projecting that they are going to make some money. A carrier will build what looks feasible to it in terms of its return on investment--or what it has to do, which is what happened in RCA's case. In order to buy the Air Force system, RCA had to guarantee to do certain things, and one of them was to provide telephone communication to 142 villages. How they proposed to do it, however, was through a VHF radio telephone system. This is a telephone system, all right, but no wires connect these places to one another. It's a very limited system with very limited circuits, so that a couple of villages using the system could block up the whole system for the region. And the system is impossible to upgrade for

broad band facilities like television or other kinds of broad band services. It met the requirements for purchase. RCA was approved to buy that system, and is now proceeding at less than glacier-like speed to implement it. We're not too disappointed in that slow rate because again, returning to this percentage of investment business, once the system is in place, then they can charge a rate based on the investment they have in the system and they become even more reluctant to provide a service of increased proportions because of the system they already invested in. This is certainly true throughout the lower 48 states--I'm not sure of Hawaii. AT&T is quite concerned about satellite technology because they have an existing system on the ground, out of which they are making considerable money, and common carriers, by the very nature of the way they are organized and the way they make their money, are going to present some problems to us if we intend to try to use the new technologies to meet some of the needs around us.

In speaking of the new technologies, we must look at what is available to us. Both Hawaii and Alaska are now using the ATS-1 satellite for some limited experimentation. But there are limits on the capabilities of ATS-1 satellite itself. We're talking about all these marvelous things we are doing with the ATS-1 satellite but its capabilities are a good deal like an old country party-line telephone, and there isn't any way that all of us can use it all of the time. We do it in shifts. It's an old, old, satellite and could do itself in at any moment and we need to be looking forward to something that's much better and more suited to our needs and requirements.

All of our firsts in communication satellites are very conditional because the commercial guys got there first. There are international communication networks, if you please, but they're commercial. Only recently have educators gotten on this bandwagon and only because we have a second-hand surplus satellite that we can use.

Beware of the declaration that the commercial guys are going to somehow "take care of us." Remember that the AM commercial broadcasters, stepped before the FCC time and time again and said, "Why, these universities don't need these frequencies. There's plenty of time in our broadcast day to offer all the educational programming that they want." In FM and in TV specific allocations had to be made to education and preserved in order to preserve education's access to them--that same thing has just happened in the satellite business with the 2500 megahertz band. Had it not happened, I'm firmly convinced that educational use of satellites would have gone the way of AM radio.

THE ALASKA PROJECT: THE ATS-1 SATELLITE EXPERIMENTS

by Glenn Stanley

A series of experiments have been supported by the Department of Health, Education and Welfare, NASA, and the State of Alaska utilizing the ATS-1 satellite. These experiments started in the spring of 1970 and continue to the present. All of these experiments have been designed to determine the usefulness of a good communications link in areas not previously so supplied. The experiments have included networking of small villages for educational purposes, biomedical telemetery and communications, transionospheric radio propagation studies, computer networking and broadcast of real-time radio programs.

The major project during the period has been the satellite telecommunications experiment supported by the Department of Health, Education and Welfare.

The presence of the ATS-1 satellite in geostationary orbit over the equator, directly south of the center of Alaska, provides an excellent opportunity to conduct communication experiments at VHF between small ground stations located in remote areas and urban areas both in Alaska and in the rest of the United States. Preliminary proposals and plans developed by the State of Alaska, NASA, the Lister Hill National Center for Biomedical Communication, the U.S. Office of Education and others, have resulted in an extensive experimental communication

network in Alaska which also connects with ground terminals in other selected locations over the rest of the world. Although the ATS-1 satellite is also equipped with a transponder operating at 4,000 and 6,000 MHz (C-band), ground stations requirements have restricted operations for this series of experiments to 135 and 149 MHz (VHF). The general purpose of the experiments may be simply stated: Given reasonably reliable communication between urban and remote areas, determine what useful information may be transmitted between these areas to improve health care delivery, general education of the populace, and education in the remote or rural schoolroom. Clearly, important auxiliary projects in the realm of transionospheric radio propagation, networking, and operational requirements of equipment in remote areas may also be undertaken.

Communication between remote areas in Alaska has traditionally been by HF radio in the frequency range from 2 to 15 MHz. At these frequencies, radio waves are reflected from the ionosphere (100 to 300 km above the earth) are returned to earth. However, the ionosphere over Alaska is extremely complex. Without a long discussion of the variables and their interrelationships as we know them now, suffice it to say that HF communications between two points in Alaska will, at best, be practicable for only a small percentage of the time and may not be available at all for several consecutive days. HF communications networks are completely unreliable and many areas may be without any form of communications for extended periods.

Communications difficulties coupled with an almost complete lack of ground transportation in most areas of Alaska serve to keep health care and education in the remote areas at a very rudimentary level. Health care in most of the remote communities is limited to a medical aide who administers to patients at the direction of a Public Health Service physician located at a regional hospital which may be a considerable distance from the community. An example is the P.H.S. Hospital at Tanana, Alaska, which is staffed by physicians who administer health care to approximately 20 villages located in an area of about 200,000 square miles. Only a few of these villages have telephones and, until the advent of this project, all communications including emergency requests for evacuation of patients was handled by HF radio. Communications to this group of villages had been less than 20 percent effective when attempted by HF. No exact measure of the number of deaths or complications due to lack of prompt treatment because of poor or non-existent communications can ever be made.

The conventional educational program is scarcely better. Most villages are equipped with a two-room school house utilizing oil stoves and diesel generator plants. Both State-operated schools of the State of Alaska Department of Education and schools operated by the U.S. Bureau of Indian Affairs are present in remote parts of Alaska. Generally two teachers (often a man-wife team) are residents in the village for the school years. Although these teachers do a reasonably competent job, they are hampered by inadequate mail service and poor communication. Village students have almost no frame of reference outside the village life and find it very difficult, at best, to adjust to the more complex town society of Alaska when they attend regional high schools. They experience extreme difficulty when exposed to the University or urban culture. Most of the village contact with the outside world is by itinerant public officials (nurses, physicians, social security representatives, etc.) and by occasional visitors. Only minimal opportunity for organized education of the general populace exists.

In the next few years there will be a great improvement in communication to the remote areas of Alaska (and to the remote areas in the rest of the world as well). Whether this improvement will come with the advent of a practical satellite communication system or by a totally ground-based system is, as yet, undecided, but it is not far distant. Our purpose is two-fold--to determine the needs of the remote populace in health care and educational delivery and, where feasible, within the framework of this learning process, to alleviate some of the problems now existing. Clearly, the former is, in the long run, most important, but we would be inhumane not to pay some attention to the latter.

In May 1971, a contract was negotiated by the Geophysical Institute of the University of Alaska with the Lister Hill National Center for Biomedical Communications of the National Library of Medicine (one of the U.S. Institutes of Health of HEW) for the establishment and operation of a biomedical communications

network in Alaska which was to utilize the VHF transponder on the ATS-1 satellite. This contract, through July 1973, is in the amount of $520,000.

Description of Work

The initial contract with Lister Hill read as follows:

Independently, and not as an agent of the Government, the Contractor shall design, establish, operate and maintain a satellite communications network in Alaska to determine the feasibility of the use of such networks for biomedical communications to remote areas. More specifically, the Contractor shall:

1. Establish a satellite communications network composed of approximately 20 ground stations in Alaska which utilize the VHF transponder on the NASA ATS-1 satellite.

   a. Procure 25 portable satellite ground station terminals to include transmitters, receivers, antennas, spares, and associated support equipment.

   b. Obtain F.C.C. licensing for the above terminals.

   c. Install the above terminals at the following proposed sites:

1. Tanana	10. Chalkyitsik	19. Barter Island
2. Huslia	11. Ruby	20. Nome
3. Nulato	12. Kodiak	21. Homer
4. Fort Yukon	13. Anchorage	22. Emmonak
5. Allakaket	14. Kotzebue	23. Hooper Bay
6. Venetie	15. Barrow	24. St. Paul Island
7. Anaktuvuk Pass	16. Juneau	25. Sand Point
8. Stevens Village	17. Fairbanks	
9. Arctic Village	18. Kanakanak	

   d. Conduct an "on site" educational program for station operators.

2. a. Operate the network for a period of approximately fifteen months (this includes coordination of all Alaska experiments).

   b. Provide maintenance for all equipment on a "quick response basis" so that no station will be inoperable for more than a brief time.

   c. Transmit and record sufficient technical transmissions to delineate the propagation perturbations found in the auroral regions. This will include recording of signal strengths of all transmission from approximately 10 selected stations.

   d. Arrange scheduling and utilization of the ATS-1 satellite both with the NASA ATS-1 Project Office and with users of the network.

   e. Coordinate the efforts of local, State, and Federal groups or individuals who are participating in the preparation or transmission of biomedical material.

   f. Provide advice and assistance to participating experimenters.

3. Evaluate the utilization of the network and evaluate the feasibility of such networks for biomedical communications to remote areas.

   a. A formal group composed of scientists, engineers, medical personnel, and social scientists will collect, collate and evaluate the use of the network.

   b. A formal comprehensive report will be prepared and submitted at the completion of the project.

4. Evaluate the educational programming which is provided by the Office of Education in conjunction with the Lister Hill National Center for Biomedical Communications.

The initial work statement has been expanded to include: 1) assist in the conduct of programs in continuing education of professional and para-professional health care delivery personnel, 2) installation of an emergency alarm system for remote areas, 3) analyze the non-use of certain stations, 4) participate in the WAMI (Washington, Alaska, Montana and Idaho) program of education of first-year medical students at universities which do not have medical schools. Future programs will include experiments in medical record system improvements for remote areas and more sophisticated continuing education programs.

In general, the purpose of the experiment is to utilize the communication capability provided by the ATS-1 satellite to provide good communications circuits between remote, rural, and urban areas in Alaska, and some areas in the rest of the United States. These circuits are then used by the medical and educational communities to transmit medical and educational material in both directions. The use of the circuits, materials passed over them, and the changes in the behavioral patterns of the users will be evaluated to determine the usefulness of the varous materials.

As may be seen from the work statement, a wide variety of programs was planned. The satellite schedule at the outset was for two hours per day on Monday through Friday. This time has been expanded during the course of the experiment to four and one-half hours per day during the week and to three and one-half hours per day on weekends and Federal holidays.

A companion experiment has been supported by the State of Alaska and the Office of Education, Department of Health, Education and Welfare, for classroom and teacher education in the remote areas of Alaska. The conduct of this experiment and the evaluation of it has been under the direction of a consortium of educators and other groups from within the State of Alaska. The educational program uses about two hours a day of satellite time, one during the classroom period and one hour in the evening. Among the innovative experiments in the educational portion have been classroom-to-classroom discussions with students from remote villages in Alaska and students from Barstow, California, native language story telling, teacher seminars, library programs, and programs in local government.

A third major program has been the rebroadcast, under the sponsorship of National Public Radio, of the program "All Things Considered" from the local FM station at the University of Alaska. This program is the only real-time, in-depth news broadcast available in Alaska.

Other programs have been supported by the State of Alaska, by the Alaska Area Native Health Service, by NASA Ames Research Center, and the National Education Association.

The ATS-1 satellite is still a viable spacecraft. The transmission characteristics of the transponder have not deteriorated and there is no reason to anticipate any failure of the spacecraft. Our plans are to extend the ongoing experiments and continue to learn what useful information may be passed over a simple voice channel between very remote and urban areas. There is little doubt that the experiments just described will have a marked effect upon future communications systems.

THE PEACESAT PROJECT: THE APPROACH
by John Bystrom

When we initiated the PEACESAT* project, it was with the thought that the Pacific area was particularly suited to a demonstration in international communication by means of satellite interconnection. First of all, there is potentially a common language in the area--English. Outside of the French areas, English is regarded as the working language. It is a language which--where it is a second language--is still nevertheless used by a large number of people. So we would not run into the problem that we might in any other place in the world where we would have a language barrier that might be insurmountable.

Secondly, the existing system of communication among the various countries in the Pacific is inadequate.

Some day we may have even bigger and better satellites but of course the carrier pigeon would be a step up in many places in the Pacific. The problem has been essentially that cable costs are linked to distance and that you can put down cable for the interconnection between continents--we have cable system going through Hawaii, to Guam and then branching off to Japan and Hong Kong. But there is no cable between Guam and Saipan, which is a distance of just a few miles. So cable technology, in other words, limits possible users and it limits them to areas in which there are large bodies of population and where they have a high level of technological development in which major industry and corporate enterprise can afford to utilize these kinds of telecommunication links.

A fairly high degree of cooperation already exists within the Pacific Basin. There is a belief that a degree of good fellowship or whatever existing among the peoples of the Pacific Basin partly may be because there is a lot of distance between them. At any rate, we thought we had an ideal place for this experiment.

We felt that we had to have a certain kind of system for this area. If you wanted to reach a place like Ponape, which has about 35,000 people, obviously you're not going to put a 5 million dollar, or a 7 million dollar ground station there. That's never going to happen.

So it had to be a system that utilized a low-cost ground station, so we have, along with Alaska, developed an experiment, a demonstration which utilizes a low-cost ground station.

Another thing was that it had to be two-way. We wanted stations in which the people there could talk back. We felt that this was essential, that cross-cultural communication does not take place when there isn't dialogue and two-way communication. Along with Alaska, we were very insistent on the necessity for two-way communication. We realized that this did not necessarily fit into the top priority in a lot of national thinking, but we nevertheless are going to persist in this emphasis on two-way communication.

And finally, we don't want to pay for any medium that doesn't do the job. In other words, if television can prove that it's 1,200 times better than a simplex voice system, then we will take it because that's the trade-off. It's got to be at least 1,200 times better if we're going to apply cost-benefit tests to it, at least at the present time.

We are concerned with the here and now. We're thinking about getting a system going in the Pacific within the next five years. So our system is designed for that job--it is not a piece of technology which we had and then looked around for some use for it. We attempted to assess the social needs of the area and then say what kind of a system will work and we came up with PEACESAT.

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* PEACESAT stands for Pan-Pacific Educational and Communication Experiments via Satellite.

From the first we wanted to use this sytem for problem-solving. In other words, our first step is to link institutions of education and major centers where there are highly developed technical personnel who need back-up information services. You put a doctor out in a remote area and he can be backed up by a clinic, and you have a man who is not necessarily going to be obsolete in five years. This is true of all kinds of professional persons who are somehow related to technical developments. So our first step is to try and tie together technologically based services.

A second kind of communications are emergency communications. This is an area of weather and transportation where real time communication is essential.

A third area--a little further down--is distributing news rapidly. I relate news needs to functional needs and as a result, this is quite a bit down the list.

The fourth area is developing a cultural understanding, and it is here where we feel we have something to gain from listening to other cultures as well as distributing our excellent television programs. This comes back again to the importance of having a two-way system, and a two-way system will require a low-cost transmitter and receiving ground station if it is to operate effectively.

The problem in coming up with the needs for communication is that most of the measures that have been developed are economic measures. How to start out applying communications in areas where no communication existed is quite different. This is the basis of a study we did of the need for communication between the Manoa Campus in Hawaii and the Hilo Campus on the Island of Hawaii, some 200 miles away and separated by water, and detailed in the accompanying Costa paper.

PEACESAT is a system in which obviously we didn't need any studies of whether there are needs or not. It cost me $27 to put in a call to Fiji in order to talk very briefly. Since the call goes to Oakland and is re-transmitted down to Fiji, it gets to be pretty expensive. So far we can't go into the kinds of requirement studies that we have undertaken with regard to the University of Hawaii. But Wellington Polytechnical University independently has developed a ground station and we engaged in what we think will be the first international educational network by satellite.

The situation in January 1972 looked like this: The University of the South Pacific in Suva, Fiji, was ready to take delivery on the ground station that was developed at the University of Hawaii School of Engineering. We were anticipating a ground station at Saipan and Truk in Micronesia (Trust Territory of the Pacific Islands), and had just received a request from American Samoa to participate in the PEACESAT Project. We expected by March or April of 1972 to have a ground station for Papua New Guinea, too.

(By May 1973, the PEACESAT system was operating with stations in Tonga, Fiji, New Zealand, American Samoa, Trust Territory of the Pacific Islands, Papua New Guinea and three locations in Hawaii. Truk in Micronesia was expected to join the system at any time, depending on the time needed for setting up the station.--The Editors).

In each of these cases, the local educational authority must receive the approval of the national telecommunications authority and this has been a very long process.

In setting up a communications system, it is not enough simply to get the approval of the educator with all of their vested interests--which don't surface until you come in with the demonstration. You must also get the approval of the telecommunication authorities who also are concerned about competition and existing investments. As a result, any kind of development is a very slow process. We feel we are on the threshhold of providing a system in which a great deal can be done in the study of cross-cultural communication.

THE PEACESAT PROJECT: TELECOMMUNICATION NEEDS OF SYSTEMS OF HIGHER EDUCATION
by Abelina Madrid Costa

Many educators are coming to grips with the possibility that communication technology can help to create an environment where students can receive information immediately when they are both intellectually and motivationally ready. The literature is filled with instances of telecommunication use in education, yet the development of methods to assess telecommunication requirements needs to be further investigated. Knowledge of requirements is a prerequisite for effective use of communication technology.

The Need

While some institutions have improved instruction through creative use of telecommunications, many institutions of education have not examined the telecommunication requirements or have not sought to anticipate the needs. The common carriers have developed techniques for assessing telecommunication needs. Their techniques, however, are geared for broad industrial needs and the carriers do not have techniques for dealing with new users of telecommunication services. Requirement studies for educational institutions have not been done.

One of the main reasons is the absence of techniques to assess telecommunication needs. The absence of techniques becomes urgent when we read about the mushrooming community colleges, the direction toward dispersed knowledge sources and research facilities, and the need to maximize the use of available resources. How do you communicate? How will you communicate? We must relate the growth of communication in education to declared policy. Advance knowledge of administration, faculty and student telecommunication needs is a prerequisite.

Approach

A study of requirements was undertaken at the University of Hawaii. The attempt was made to anticipate needs as they related to the growth of the University and to the requirements of faculty members. Three methods were utilized: (1) identification of University organization, (2) survey of existing communication practices, (3) queries into educator needs.

The University of Hawaii has particular interest in telecommunications: it is the single State institution of higher education in Hawaii and it is centrally funded and geographically dispersed. The main campus is located on the Island of Oahu. The system includes a second four-year campus at Hilo, Hawaii, three community colleges on Oahu, and one each on the Islands of Hawaii, Maui, and Kauai. In addition, the University maintains space observatories and research facilities on various islands. This multi-campus system functions as a unit under a Board of Regents and is managed by one President. This arrangement is unique in the United States--a system of higher education which encompasses all public institutions of higher learning, including vocational, spread over a geographical area separated by water.

In this context, the questions raised were:

1. How effective are telecommunication services within the University of Hawaii system? Are the services sufficient to maintain and integrated institution?

2. Does the University have adequate "tools" for assessing the need for telecommunications?

3. What are the telecommunication needs?

Initially, the nature of the organizational structure, the objectives, and the salient policies governing the institution were examined. These include equal educational opportunity which provides for the availability of options to suite the capacities of individuals, and the maintenance of diverse cultures found in the State because of Hawaii's proximity to Asia and the Pacific. The salient policies are geared to reaching these aims adopted by the State. A policy of controlled growth limits the enrollment in each college in the system.

A policy of dispersion spreads its learning centers, thereby decreasing the pressure on a single campus. A policy of selective excellence takes advantage of Hawaii's physical and ethnic setting. It seems natural for Hawaii to have an East-West Center and a Pacific Biomedical Center.

These policies, in an integrated system, suggest that there are telecommunication needs. The nature of telecommunications will in part determine the degree to which the policies can be implemented and the growth of the University. Coordination requires communication and increasingly this means telecommunication.

The investigator also surveyed the communication practices to determine the extent to which the University of Hawaii was currently utilizing telecommunications. It was found that the University of Hawaii's use is largely the telephone. Therefore, telephone traffic was examined. Mail, cablegram and travel frequency, as possible indicators of telecommunication needs were also examined. The cost of maintaining a telephone system for one campus would, in the next year, increase to approximately half a million dollars.

Cablegram service activity was examined. However, it was discovered that records for predicting needs were not kept. An attempt was also made to examine the frequency of travel or personnel exchange among University branches as an indicator of the need for lecture or course sharing. Again, adequate records were not kept. Thus, attempts were made to determine the requirements but record keeping was insufficient to predict the level of requirements.

In addition, a pilot effort was made to determine the demand for telecommunication service. Fifty-two interviews were conducted at the Hilo College Campus on the Island of Hawaii and at the Manoa College Campus on the Island of Oahu.

The writer focused on the telecommunication requirements of Hilo College because of its geographical remoteness from the Manoa Campus. It is the second four-year campus in the system and the biggest branch of the University outside of Oahu. It seemed most likely that this is the area of greatest telecommunication needs. A very important criterion in the study of telecommunication is the distance separating any two "correspondents." The basic interview question asked was, "What are your communication needs?"

It was found that many faculty members have the desire to communicate with areas in the West Coast and the Pacific. Information on courses on the other campuses and "contact with all foreign education departments" were examples of specific and general types of information needed. The needs ranged from ship to campus communication and computer to computer communication. There is an increasing tendency to rely on government and business institutions for information, collaboration and consultation. There were expressed needs, such as: "There should be more consultation, planning, and conversation with other faculty members--an extended discussion on curriculum matters like 'how to schedule courses.'" "Our people are limited in funds for travel, and the person is gone all day for a meeting which lasts an hour." "There is a need for all-campus meetings." "A lot of funding is lost because of high cost of communicating."

Based on this study, several basic conclusions were that:

(1) Dispersed campuses require adequate telecommunication services.

(2) The present level of record-keeping does not provide the data for effective decision-making for telecommunication services.

(3) There is a growing requirement to communicate: (a) among all branches of the University system, (b) with other States, (c) with the Pacific Basin Islands. The tools for predicting the probable traffic are inadequate.

Plan of Action

As a result of this study, several actions are required:

(1) Examine record-keeping practices with an emphasis on predicting future needs.

(2) Continue efforts to determine administrator, faculty, and student requirements in communication.

(3) Embark on a systematic program to improve communications through research and development of creative uses of existing telecommunication resources. There needs to be an organized effort to make full use of common carrier services at a lower cost.

In considering the requirements of faculty members, these are possible telecommunication objectives:

1. Interconnection of all colleges in the University system.

2. Interconnection with mainland educational institutions.

3. Interconnection with Pacific Basin institutions.

4. Low cost for all links.

Institutions which depend upon the dissemination of information and exchange of ideas must consider those services which make the task easier, less expensive, and equal. Assessing telecommunication requirements is a step in this direction.

THE PEACESAT PROJECT: APPLICATION OF COMMUNICATIONS SATELLITE TECHNOLOGY

by Paul C. Yuen

The ATS-1 satellite was launched on December 7, 1966 from Cape Canaveral, Florida, and reached a geostationary orbit on December 16, 1966. With respect to communication systems the geostationary orbit is important because it means that the satellite rotates about the earth at the same speed that the earth revolves around its own axis. Thus as far as a person on the ground is concerned, the satellite appears to be fixed in space. This means that high-gain antennas can be pointed in a fixed direction without the necessity of including complex and costly rotating systems to follow a moving satellite.

The ATS-1 satellite is positioned at 149° west longitude with an antenna having a very broad radiation pattern. About one-third of the earth's surface under ATS-1 is covered by the satellite, including essentially the entire Pacific Basin area. ATS-1 is about 22,300 miles from the surface of the earth, which means that signals from a ground station travel twice that distance or nearly 45,000 miles. This distance is very much greater than separations on the ground so that for communication between two points on the ground, the distance between stations is almost negligible compared to the path from the ground to the satellite and back. Thus cost factors are essentially independent of the separation between two ground-based locations.

A number of transponders are aboard the satellite and three of them are of especial interest. Two are used alternately for transmitting status information about the satellite to the NASA ground stations. These are also used by researchers across the U.S. and the Pacific for basic studies of the upper atmosphere. The Radioscience Laboratory at the University of Hawaii is one such research group and the results of the study have been of great utility in the PEACESAT Program.

The PEACESAT Program utilizes the communications transponder, which is an active, frequency-translating, limiting (Class C) repeater suitable for frequency-modulated signals. Two output modes are available from the satellite transponder: full power of about 40 watts and half power of about 20 watts, selectable by the NASA ground control station. These power outputs combined with a satellite receiver noise figure of 4 decibels and satellite antenna gain of 8.5 decibels make possible the use of simple, reliable, easy to operate ground stations.

At Hawaii, the azimuthal bearing of the satellite is about 8° east of south and the elevation angle is 72° from horizontal. The high elevation angle at Hawaii and most of the other PEACESAT stations helps to minimize ground reflections and interference. The uplink frequency of 149.22 MH_Z and the downlink frequency of 135.60 MH_Z permit the use of modified, commercial and amateur-band VHF equipment at the ground stations.

The satellite transponder's bandwidth of 100 Kh_Z is suitable for several channels of voice or music but insufficient for television. It can be used with teletype and both black-and-white and color facsimile as well as slow-scan television. Also, such information as electrocardiogram or electroencephalogram records can be sent via this channel either from hard copy records or taken from patients in real time.

Parameters of the satellite transponder are such that ground stations can be quite simple and relatively inexpensive. They also permit the utilization of remote control equipment and portable equipment. Simple receive-only equipment employing a simple Yagi antenna and transistorized receivers can be used to receive broadcasts.

THE PEACESAT PROJECT: GROUND TERMINAL HARDWARE

by Katashi Nose

PEACESAT budget constraints placed severe limitations on the procurement of hardware that would meet technical standards and at the same time provide reliability. Military surplus was ruled out because of the limited availability of such units which thereby would preclude future expansion of the system. Military equipment built for such special purpose as ours is bulky and has frills which are not required for our purpose.

Commercial equipment (Motorola, GE, RF Communications) would have gone far above budgetary constraints.

Requirements

PEACESAT equipment had to be something which could be transported readily throughout the Pacific Basin, that could be operated by non-technical personnel, easily set up by non-technical persons, inexpensive and reliable, and adaptable to different power sources in use (i.e. 250 volt one side grounded 50 cycle, 110/220 60 Cycle American Standard, 12 volts DC.).

Preliminary Engineering Survey

There was no information in the literature concerning low cost ground satellite terminals, all studies involving governmental or liberally funded research studies.

Information contained in the government manual "ATS Users Manual" finally gave a small clue to the power requirements for uplink triggering of the satellite. Once this was known, the hardware was designed and built to meet these specifications. The uplink and downlink engineering calculations around which the hardware was designed is attached.

The Solution

Two types of terminals were built as follows:

a. Primary High-Powered Terminal.

1. 500 - 1000 watts output.

2. Circularly Polarized Uplink Antenna using Crossed Yagi's. Linearly Polarized Downlink.

3. Remote control audio facilities and control system.

4. Capability of using Voice, Radio Teletype, Facsimile, and Slow Scan TV.

5. Three-way Redundancy.

b. Secondary Low-Powered Terminal

1. 100 watt output, commercially built.

2. Circularly Polarized Commercial Uplink Antenna. Linearly Polarised Commercial Downlink Antenna.

3. Capability of using Voice, Facsimile.

4. One-way Redundancy.

The Hardware

Budgetary considerations forced the project to fabricate the hardware as much as feasible and use of amateur radio components which are mass-produced and thereby very inexpensive.

The large amplifier for the primary station uses a Strip-line Eimac 4CX1500A pentode, driven by a 40-watt transistor amplifier, which in turn is driven by a Kuranishi Marker Luxury ML-2 10-watt transceiver which serves both as a receiver and transmitter.

The duty cycle of critical units is expanded by use of blower fans throughout, thereby permitting longer transmissions (key-down tests of 1 1/2 hour duration results in no change in performance).

The Antenna

Circular polarization is maintained by crossed Yagi's which were fabricated in the Physics Machine Shop as were all amplifier components. The crossed Yagi was chosen in preference to the Helical antenna for ease of transportation (antenna folds up into a 5' x 3" x 4" package for the low power terminal, and 5' x 1' x 1' for the high power terminal).

Antenna supports are standard aluminum Nu-Rail staircase supports arranged into a tripod configuration adjustable to different elevation and azimuth.

Redundancy

Should there be a breakdown in the amplifier unit in the primary terminal, the operator can switch the antenna to the intermediate (40 watt) amplifier and carry on communication on a limited scale with reduced signal strength.

Should there be a complete failure of both power source and amplifier, the 10 watt transceiver can be used alone from a 12 volt (automobile) battery with marginal signal strength.

Each terminal is provided with two transceivers which are interchangeable should there be a breakdown in either unit. Normally, one transceiver is used for uplink and downlink communication, and the other for continuous monitoring of the downlink.

Each secondary low-powered terminal is also provided with two transceivers used in the same way as a high powered terminal. Redundancy capability is reduced to one 10-watt transceiver unit.

Each high-powered terminal is also provided with a low-powered amplifier (100 watts), so that in effect it also has low-power capability as in a secondary station.

The efficacy of redundancy has been demonstrated many times in the field (e.g. Fiji hurricane, New Guinea and Tonga malfunction).

Portability and Ease of Installation

If the proper power source is already available, the high-powered terminal can be installed and working in four hours of working time as demonstrated by the Hilo, Hawaii terminal. This is assuming that the installer is familiar with the equipment.

The low-power terminal fits into an attache case, and if a 12-volt battery is available, with portable antenna hand-held, the station can be installed and working in 15 minutes.

Developmental

Tests have shown that by using a receiver the size of a pack of cigarettes, with built-in batteries (9 volts available anywhere a transistor radio is used) a person in the jungles of New Guinea can receive Washington D.C. directly by aiming a hand-held 4-element linear Yagi antenna (3' x 3') at the satellite.

Following are requested calculation for uplink and downlink systems. Downlink systems has already been successfully tested by reception of weather map signals transmitted daily for Weather Bureau. Transmitter has been successfully tested with dummy load.

UPLINK (149.22 MHz)

Transmitter power (one kilowatt)	60.0 dbm
Transmitting cable loss	-3.0 db
Transmitting antenna gain (See Note 1)	10.0 db
Free space loss	-167.5 db
Receiving antenna gain	7.5 db
Receiving cable loss	-1.3 db
Carrier power at receiver	-94.3 dbm
Noise power density	-169.1 dbm/Hz
Carrier-to-noise ratio per unit bandwidth	74.8 db/Hz

DOWNLINK (135.6 MHz)

Effective radiated power (Mode 2)	40.0 dbm
Free space loss	-166.6 db
Receiving cable loss	-3.0 db
Receiving antenna gain (See Note 1)	10.0 db
Carrier power at receiver	-119.6 dbm
Noise power density	-170.5 dbm/Hz
Carrier-to-noise ratio per unit bandwidth	50.9 db
Receiver bandwidth (30 KHz)	44.7 db/Hz
Carrier-to-noise ratio	6.2 db
FM improvement (See Note 2)	28.6 db
Signal-to-noise ratio	34.8 db

Note 1. Gain of crossed-dipole Yagi antenna phased for circular polarization and receiving a linearly-polarized wave.
Note 2. Maximum deviation of 15 KHz for maximum modulating signal of 3 KHz.

COMMUNICATIONS TECHNOLOGY AND THE UNITED NATIONS
by Chief S. O. Adebo

The United Nations' responsibilities--the primary responsibilities--are not simply keeping itself informed and so on, but promoting the best development, and the best use, of the communication system of the world. In other words, while the UN shows a lot of interest in getting hold of these new facilities for internal purposes, its primary interest is the promotion and regulation of the international use of these new facilities of mass communication.

UNESCO has done a lot of work in the field of communications naturally, including the promotion of the establishment of experimental satellite programs. The Indian Government, for example, is using the American satellite for the promotion of educational developments. This is one example of the way in which the United Nations system attempts to insure that the facilities which are being brought into existence by technological change get used by the developing countries.

There are many problems involved. There is not much hope in calling a big, international conference to solve all of the problems involved in satellite communication. The conference would go on, arguing, becoming political and so on, and you won't be able to solve very much. These things can best be done on a gradual basis--piece by piece.

The India project is the kind of experiment that will help very much in showing what can be done and how it can be done in the interests of the world as a whole and in the interest particularly of the developing countries. But that is not to say that any of the problems should be blurred over--these problems are there to be solved and can be solved.

Now, within the United Nations itself, what are we doing? The United Nations has the responsibility of promoting the use of communication in the world. But it also has to put its own house in order. If we are going to encourage the use of communications in all the countries of the world, we must also put our own house in order communications wise.

Communication is not only a matter of the function of the equipment that you have, what you communicate is important. In the United Nations, we have a great deal of overlap and people are repeating what others have done and done well. We have a lot of documentation in the United Nations General Assembly now--we are flooded with it, we are sinking under the burden. We have to find a way of reducing the amount of complication so that communication is not lost because of the volume.

Some of the delegations have no place for putting these documents, they have no time for reading them, and so on. So, we are looking not only for technology, for speeding the flow of communication, we are also looking for ways of reducing the volume of documentation. In this connection, my own agency Unitar is among the most keenly interested in the United Nations system. We have to try and see that information goes out to the grass roots level, to the general public all over the world.

We also want to be able to use satellite technology. Not only do we want to promote the use of satellites by developing countries, we want to be able to use it for the United Nations itself. The United Nations, whether it likes it or not, will have to remain in the peace-keeping field as part of its basic function. Peace-keeping round the world also means peace-making. People collect and send information to the United Nations so that it can prepare documents for the different organs so that they can tackle problems before they reach explosive condition.

In the United Nations, some years ago, there was a crisis in one part of the world. For 24 hours we just didn't know quite what was happening there. The United Nations didn't know anything. We lost complete contact with our representatives in the place. Why did we? Because we had no separate communication channels of our own. We have to borrow facilities from the different nations, but if the particular country you are dealing with has an interest in keeping you out of the picture, you can be kept out.

Lack of a good feedback system is one of the weaknesses of the United Nations communication effort. What about the United Nations informing itself of what is happening apart from just reading the New York Times or the London Times or the Moscow newspapers? The signs are not promising.

People and nations are very sensitive. It has been suggested that the Secretary General ought to have representatives in the different countries who will send reports to him so that he will be able to alert the organs of the United Nations about any simmering problems before they take on impossible proportions. This sound exceedingly logical but many of the countries take the view that they don't want anybody snooping in their countries. There is also the fear that they are going to report something that will be inaccurate. The host countries won't be able to censor and make quite sure that the reports are accurate from their point of view!

Of course, that is not the only reason. Nobody wants his skeleton to come out into the public if he can help it. For this reason the proposal has not caught on. But we have to continue to strive for this. Everybody says the Secretary General ought to alert the Security Council about these matters and not wait until the shooting has started. This is all right if the dispute does not involve your country, but as soon as it involves your country, then you don't want anybody, including the Secretary General, coming to push his nose into it. This is the way in which that proposal has been received, generally.

It is not all countries that take this view. There are countries in which we ought to be able to establish some sort of system that would give these warning signals. The proposal is not abandoned but at this moment, I don't think that if you put it to the United Nations it would carry.

To those who feel that the United Nations ought to keep its nose out of everything, this is fine, but for those of us who feel that the United Nations ought to know what is happening so that it can alert the different organs of the United Nations, it is not. We must think afresh and we must organize imaginatively to meet this challenge. It won't be easy because different countries have their own ideological positions in this matter. If we succeed in sharing satellite facilities, we will be able to improve our communications with the different areas of the world. What is the prospect for this? The future is hopeful, judging by the kind of discussions that are taking place, judging by the contacts that we have at UNITAR with people who are handling these matters. I think if you judge only by what you see in the press, you will think the United Nations' future is even more bleak than it really is. But newspapers don't truly reflect the things absolutely.

IV COMMUNICATION IN THE FUTURE

PREVIEW

Communication in the future should really be read in the plural, futures, in the sense of alternative futures, as suggested in the Dator paper in this section.

In the last quarter century, "classic" science concentrating on a linear cause and effect has been moved to the sidelines in favor of a more complex interactive science. The study of complexity parallels the study of systems. And in the same time frame, the systematic study of the future has come about. Interactive science, complex systems and future study are, of course, closely related.

Within the field of communication, the problems of population communication pose complex and interactive problems. The new technologies offer possibilities of the needs and uses that can be specified. Other technology can be invented when it is needed--if the needs are known.

To a large extent, the study of the future of human communication promises to become the study of the anticipated human needs for communication and the ways of determining those needs. The central question becomes, what are the future communication needs of man--at the individual, community and world levels. And when the needs at these levels are not in harmony, how can the development of harmony be facilitated. The Delphi technique, widely used, can be anticipated to provide part of that prediction. Equally, social forecasting and the extrapolation of world trends also can be expected to provide useful information.

In the papers included in this futures section, the question of need is a central concern. What are the future communication needs of man? What technology is required to serve these needs? What breakthroughs are anticipated?

Lerner considers the past, present and future communication revolutions. He notes that movable type came in about 500 years ago; camera and film were developed less than 100 years ago. Within the last 50 years, radio and television became widespread. Lerner considers we are now involved in a major communication revolution--characterized in part by the shift to neo-Lasswell paradigm. Further, he suggests that next communication revolutions will be led by developments in the laser, computers and miniaturization.

Lerner stresses that, up until 200 years ago, the regions of the world, and the communities in those regions, were at similar levels of development. Then, the communication revolutions, especially the print revolution in Europe, created a fundamental imbalance. At the same time, there has been a marked acceleration of history, evident in the increasing frequency of communication revolutions and other radical changes. At the same time, a higher percentage of the world's people have begun to participate in the affairs of their society. Finally, the imbalance begun by the print revolution in Europe has been increased by a flow of communications from those communities that have the technology to those that have not the technology, or in other words, the flow of communication is from developed into the developing nations.

Lerner's final point is that we now have the resources to correct that imbalance by distributing communication technology, particularly the transceiver technology to the have nots, and thereby restore a balance that has been absent for 200 years. Toward that end, he calls for a fair communication policy.

In his paper, Corragio emphasizes that until recently man lived in the small, local community. Within that community, communication was easy because it was the same and familiar. Then, as Lerner outlined, man was thrust into a series of accelerating communication revolutions, and the whole world was literally at each man's fingertips. "Every sound," Corragio says in talking about music, "that (man) has heard before from every country is available to be put together." Communication has become difficult, and new alternatives are appearing. One such alternative is cyberspace, or biofeedback. While still very primitive, biofeedback promises to bypass language and make possible direct brain to brain communication.

Dator begins his discussion of possible new technologies by observing that we still are locked into the older "papers and conference discussion" formats. He sees the new technologies as arising as responses to and consequences of population growth and physical mobility. He cites speech, drawing and writing as illustrations. In terms of technologies, he urges that we "fool around with them," and find out what we can do with them. And, he observes that the new technologies enable us to communicate in a very real sense with others who are "not here."

Dator foresees that the new technology will serve individual, personal and intimate needs. He contrasts these uses with those mass uses of the earlier communication technology. He suggests that technology, as it becomes increasingly smaller, will disappear "under the skin." In time, human communicators will use electrochemical hookups to bypass our present symbol systems. Further, the newer data retrieval systems will enable us to obtain only the information we want, and none that we don't want. He concludes that it will be impossible in the future to monopolize the new technology.

Mass communication has tended to dominate much of modern communication concerns but the technology is now with us to not only provide feedback or two-way television but, as Sanborn notes, to provide the "possibility of focused communication, a message hand-carried to the viewer." Sanborn likens some uses of 1/2 inch portable videotape equipment to a letter or telegram--something highly directed but severed from the production. The sender can review it before sending it, and the receiver can play it over several times. Sanborn sees the videotape as a way to bring out-of-touch groups together, without physical presence, without an intermediary, without "eyeball-to-eyeball" confrontation. Focused communication offers communication possibilities in areas where there were none, or little, and it brings in the humanistic element in a time of mass audiences and one-way communication.

The final paper in this section by Yanoviak spans the range from the microbiological to the astrophysical. He is in search of breakthroughs that will radically transform communication and a wide variety of other endeavors as well. He points out the uses and limitations of symbolic modeling. He also asks what will happen as the growth curves observed in communication technology, population growth and other areas are extended--chaos of a new order? Yanoviak sees the pulsation and dynamics of the growth process itself as being influenced by and in turn greatly influencing human communication.

The terms participation, interaction and complexity and their synonyms appear frequently in the following papers. To underline the point, note that there is very little mention of the mass one-way media, and there are frequent references to the personal, two-way transceiver technology.

You will observe, as we were surprised to do, that oligarchy is set aside and participation is amplified. The transition from Lasswell to the neo-Lasswell appears to be an integral and unifying potential of human communication in the future.

The communication needs of man can be assisted by the fair communication policy supported by Lerner and provide the groundwork, as d'Arcy observes elsewhere, for the Right of Man to Communicate.--L.S.H.

COMMUNICATION REVOLUTIONS: PAST, PRESENT AND FUTURE
by Daniel Lerner

One of the ways I've amused myself in thinking about communication revolutions of the past was to read what alert, sensitive observers of these revolutions had to say about them as they were happening. I've culled from that reading a few quotations, which I could give you by heart, because I think they're so good I've memorized them.

About a hundred years ago, Henry David Thoreau, living in the midst of the communications revolution that erupted on the U.S. mainland after the Civil War, said: "We are in great haste to build a magnetic telegraph between Maine and Texas, but Maine and Texas, it may well be, have nothing to say to each other." This is certainly one of the dicta we might be reflective about today as we hasten to build a satellite system that links the whole world by sound and sight.

As the century turned, Mark Twain, another rather acute observer, looking at the surge of public compulsory education, mediated communication, and the spread of news of all sorts, said: "The good Lord created us all ignorant. When we change his plans, we do so at our own risk." And that, too, I think, is an alert preview of our current situation.

As we moved into the twentieth century, George Bernard Shaw looked at what the British were beginning to do in their Empire by bringing literacy and education to selected natives. Shaw, a Socialist, an anti-imperialist, said: "How can you dare to teach a man to read before you have taught him everything else?" Again, an alert preview of what is happening to us in our times.

In citing these sages talking about the communication revolutions of the past, I've sketched an outline based on technology. The first of these revolutions came about five hundred years ago, when Gutenberg's invention of movable type gave us that first great mass medium known as print. The second came about 100 years ago with the invention of the camera and gave us film. The third came about 50 years ago with the vacuum tube that gave us radio. Most of what's happened in communications, has, in fact, happened since then in the last 50 years, and a good bit of it in the last 25 years.

As a boy just after World War I, I can still remember an older cousin of mine building our first crystal radio set. Now, we are told by a man who knows, that he considers satellites old because he was already studying them in 1958. I suppose I'm just too ancient to think that 13 years is a long time. What I want to stress, really, is that so much of what we think of as the current communication revolution, the on-going revolution, strikes me as "revolutionary" because most of you have never known the world without these things. And perhaps the function of an old man is to remind you that things were not always this way.

The revolution that is coming includes the technology of lasers, chips, computers--the continuous miniaturization and reduction of scales, and cost that bring communication technology, rapidly, simultaneously, and continuously to most parts of the world that never had access to the media before. We are learning things whose consequences we cannot possibly foresee. For instance, it's only a year since we discovered that we are likely to be able to bounce radio signals off the dark side of the moon. There may be some people who know what this means. I only wonder.

The thing I would like to stress in talking about these revolutions--past, present and future--is threefold. First, note the acceleration of history which we have seen. For example, print, invented in the fifteenth century, didn't really enter into the lives of people until 300 years later, with the "penny

press" in Britain. Television, which is only 20 years old, seems to most young people very "old hat." Yet I spent most of my life without ever seeing a television show. So, we have this "acceleration" which has been increasing over the last half century and is likely to increase over the next decade with satellites and transistors. I think we are living through things year-by-year now whose consequences we will not foresee, will not experience, until all of us are old.

The second thing I want to point out is sociological; the significant thing that has happened as technology spread around the world is what Karl Deutsch calls the "mobilization of the periphery." In each society of the world, people have been brought into public participation who never were part of it before--through the phases of psychic mobility, physical mobility, economic mobility, social mobility, political mobility. There has evolved, particularly in the West, a kind of participant society which felt, until a few years ago, "normal" to most of us who grew up in it. It seemed normal that people who had cash should also listen to radios, read newspapers, should vote. All of these things seemed to us to be the normal way of life in what we call democratic society, or, in more neutral language, participant society. This Western model has been the object of admiration and the target of attack in most of the rest of the world.

Now, I would like to spend a few minutes on what I see as the problem the rest of the world has with the Western model. Five hundred years ago, the world was relatively uniform. Europe was not any more particularly advanced than the Middle East, or Russia. Most people lived on farms; it was an agricultural world. Most people lived a communal extended-family type of social structure. Most cultures were traditional in the sense that they were pre-literate. Most of them were hierarchic; they were governed by kings and courts. Most of them were poor. In these important ways, the world was relatively homogeneous 500 years ago. What changed this was the communication revolution that occurred in the West, particularly in Europe. It began to separate these countries from the rest of the world by making them rapidly (a few hundred years is a pretty short time in my book) technological, industrial, communicational and politically participant. At that point, what we think of as the West, the modern societies of the West, became crucially differentiated from the rest of the world. This is why we now have a "third world," in which the predominant role of the West as the world leader has not been challenged over the past 200 years and cannot be successfully challenged in the foreseeable future. What we have instead of challenges to the West are efforts to accommodate themselves, by most of the rest of the world, so that the West has developed.

But we have been told by scholars like Gunnar Myrdal and Barbara Ward that the gap between the rich and poor countries is in fact growing, that the rich are getting richer faster. The Western model has been adopted successfully only by such countries as the Soviet Union, Japan, Israel--all under exceptional conditions. Most of the rest of the world remains comparatively rural, agricultural, illiterate, and poor.

The flow of communication has been, and increasingly is, from the rich to the poor. When satellites fly, they are American satellites operating largely under American control. The efforts that have been made to share the wealth have been inadequate, and this is the note on which I would like to conclude.

My final point concerns a fair communication policy. By "fair" I mean roughly the same thing as a fair trade act. This requires the creation of laws and institutions which equitably share the communication wealth of the world in such a way that everybody can, to some acceptable extent, participate in its use. We have a moral and political basis for this. I needn't stress that it is written in the basic documents of American life. A phrase like "decent respect for the opinions of mankind" ought to be well known to all of us. We have the technological basis for activating this concept now. We can speak now of the "world communication network" in terms that were not possible even 10 years ago. We have the means of "fair trading" the technology which comes from countries like the U.S., Japan, Soviet Union, Germany and Britain. We have the means of redistributing and sharing the communication technology of the world in such a way that all can participate in reasonable measure.

Chief Adebo opened our conference, in his keynote talk, by speaking of the quite proper claim of the U.N. to share in these satellites. I would not only accept that; but I would add that it is among the urgent tasks of all who are concerned with communication to see that Africa, Asia, the Middle East, Latin America--all the less rich countries and continents of the world also get a fair share in this technology. If we go about this task seriously, the world that was divided into "haves" and "have nots" a few hundred years ago will, by means of this new global communication revolution, develop the potential of re-uniting and reintegrating itself. This is why all of us must be concerned with what is done to share the communication wealth in the decade before us.

CREATING NEW COMMUNICATION DIMENSIONS

by Peter Coraggio

Man, up until recently, lived in small regional or local societies. He spoke the same language as the guy next door, his head was in the same place, he played the same games, he wore the same feathers and he played the same instruments. The instruments and all the art grew right out of the environment. There was a lot of red clay in the environment. He made pots of red clay. Through a lot of snakes he made instruments of snakeskin. The environment dictated what type of instrument he was going to make, and what type of language he spoke. Man was a direct mirror of his environment.

The musics that sprung up were regional. The song that one person sang was the same song as the next guy sang, the same melodies, the same harmonies, the same rhythm, and he did the same dances.

Communication was easy. He married the same type of person. He had kids who grew up with the same type of things. Change came slow. It was easy to communicate.

Then all of a sudden man comes into the 20th century, a communications explosion erupts. Man still lives in his environment; but what is his environment? We have all the musics of every nation at our fingertips. All the instruments that have been invented since the beginning of mankind are still around and are available to the composer. Every sound that he has heard before from every country is available to be put together.

We also have another environment: inner space. An awful lot of experiments have been done there lately by psychochemicals, such as LSD, exploration into the self and meditation. This creates a problem in communication.

In the past, everybody's head was in the same place so they could talk to each other. But who are you to talk to now? The only general thing I could say about art today is that it's diverse. Everybody is doing his own thing. I'm doing my own thing. I'm doing it differently every time. Sometimes I'm doing things related to computers where there is total control of sound, where every little vibration is calculated. The location of every sound that I want in a piece is placed in space. It takes hundred of hours, maybe, for a few seconds.

But I'm also doing some other things of almost total chance. I had fun taking a tape recorder and recording the environment sound of space, TV, our voices, buses and cars, then take the tape and cut it up 500 times and throw the pieces in the air, step on them a few times, splice them together and play it and say, yeah, that's my composition. Total chance. You could do that, too.

Who am I communicating to? Maybe that's why we're here today. We find it's so difficult to communicate because our heads are in different places. When we listen to pieces today, listen to music, see a dance, we find that we have a difficult time coming into it with prejudice. The kids today, especially over the last couple of years, are beginning to just groove on things. They listen to harpsichord music and rock music and all kinds of music coming together because they are afraid to come in with prejudice.

In order to evaluate something you have to have your head in the same place. We hear a lot of rock music that returns to raw human emotions, the beat, the primitive. These are things that people can communicate together.

This little box is an alpha feedback box. In the last couple of years there's been a great surge toward biofeedback art. This little alpha box picks up the alpha wave from the brain and sends out a voltage. The synthesizer is controlled by voltage. I could take the voltage from this box and control any parameter. If I want to control loudness, the stronger my alpha wave is in my brain, the more voltage coming out, the louder the sound. Or I could control pitch so that the melody could go up and down. Basically, we have the voltage that can come out and support any parameter. A couple of crude electrodes clipped to the head produce an alpha wave, produces a voltage. I listen with my ears to the sound, to the change of the sound, and there is a biofeedback loop. As I change the sound, the sound comes in through and changes my internal set which, in turn, changes the alpha feedback which changes the whole thing and comes back and changes me.

Now this is at a very crude stage. It is very difficult to isolate certain brain waves. But it is possible within four or five hours of training to really start to manipulate your alpha and do things with it. In fact, the people who have had training in Yoga or in meditation take to this very rapidly. They all of a sudden know what those Zen Masters were talking about because they could feel the change and they could hear the change and you could put it through a TV screen or oscilliscope and see the change.

Where will this lead? It will be possible in the near future to hook up the dancer with electrodes, tap her muscles, tap different brain waves, tap all different types of body functions and send that to a computer. The composer or the artist will program that computer so that different waves will do different things, have different functions. The dancer then could start dancing and as she dances she makes the music and as she listens to the music, she dances to herself. Okay. Mind expanding.

Where will this go in communication? We find that biofeedback loops, in listening to the sound and reacting to it mentally, one can change his psychophysical state. What we're talking about is that in the next couple of years, we'll be able to start to communicate using those psychophysical states. So a science fiction idea of communication--brain-to-brain--is not very far away. Maybe it might even do away with language.

SOME POSSIBLE COMMUNICATION TECHNOLOGIES IN THE FUTURE

by James Dator

The letter from Conference Chairman L. S. Harms which invited me to present my ideas about some possible communication technologies in the future, contained this sentence: "It would also be much appreciated if you could make available a five or six page summary or outline of the points to be covered in your presentation." Although I did this, the request struck me as quite paradoxical. Here I am being asked to present my ideas about future communication technologies, and yet I am expected to write a summary of them. Why not videotape? Why not film? Why not a holograph? Why not an electroencephalogram? (And why am I writing now these words to be imprinted in a volume which purports to contain a record of the thoughts expressed at a Conference on Major Issues in World Communication in January 1972? And why are you reading them?)

Beyond that, how could I be expected to know, in November 1971, what I was going to want to say at the tailend of a conference in January 1972? That I should have such foresight presumes the world to be much more stable than I think it actually is. To be able to predict, months in advance, what will have been said before me, and what I need to say now, requires that I have a finite and non-expanding amount of expert knowledge about which you have a finite and

non-diminishing pool of ignorance. Perhaps that is the way it used to be, back in the Middle Ages when "conferences" were invented, but it is not the way it seems to be at present. (As I now sit "revising" what a typist thinks I said according to a transcript of my taped remarks, what should I write for you who are reading this paper in your present but my unimaginable future?)

If I can't even predict and prepare for so modest a future as this, how can I be expected to say anything noteworthy about communication technologies in the future? I don't know what the world will be like within the next 30 to 50 years (that span of time that I will consider as "the future" for much of this paper). Rather, from my point of view in the present (1972-73), I see a number of "alternative futures"--possible paths of future development--which themselves are nothing more than a distillation of various people's present images of a desirable, or fearful, or probable future for human society.

Until they begin to think about it--i.e., until they are forced by betrayed expectations or rude people to consider why they imagine the future to be the way they do--most people have what I call "commonsense images" of the future. They have the sort of images which humans have generally had over the past million and a half years: the expectation that tomorrow will be like today, just as today is thought to be essentially like yesterday. While things may "change," they do so either predictably (probably cyclically) or uncontrollably. Thus, if I wish to look forward to the future, my "commonsense" tells me that all I need is look backward to my--or my society's--past. There I will find the future prefigured in the values and structures of days gone by.

Some people are arguing that we can no longer do this. Something is happening to render erroneous--perhaps dangerously so--the assumption that we can look forward with understanding by looking backward with wisdom. Some people say that we have so seriously modified our environment, and the delicate relationship between human population size and the "natural" environment, that we seem to be headed to eco-castastrophe. The future seems unbearably bleak because of our imprudence and our hubris--our insane belief that we should subdue and multiply and assume mastery over all.

We must--indeed, we are being forced to--go back, to slow down, to return to the more "human" technologies of an earlier day, so this argument runs. The message from the future is "stop and return while there is still time." The image of the future is that of a dystopia.

In such a future, there is no point to speculate about the shape of communication technologies. Alas, we know them well: speaking, perhaps reading and writing--very little writing though: we must save those trees, and we have little oil to use to run and lubricate our presses. Our communication technologies must be as they were before the industrial revolution. It must be so both because we have witlessly exhausted the energy and material resources necessary for the communication technologies of the present, and because, in any event, our current communication technologies are dehumanizing in and of themselves. It is positively inhuman to place the barrier of machines and electronic molecules between human and human as we have. The impersonality of print is bad enough, but radio, television, telegraph, the computer and all the rest are demonically dehumanizing. The anomie and alienation of the present world--that which we might call "future shock"--is in large measure the result of the reckless application of our inhuman modes of communication. We do well (such a vision of the future says) to destroy the technologies of the present before they destroy us and to return to "natural" ways of human communication.

Others see the future differently. The environmentalists' fear of extinction by pollution, population, and power falure are ungrounded, some people argue. We will find--indeed, we have found--solutions to all these problems which will permit humans certainly to continue with their current modes of communication, and probably to develop others still.

Now, among those who do not see the environmentalists' spector, there are still some who say that we have come to the end of further technological advance in communication technologies. They point out that we now communicate at the

speed of light. We cannot possibly communicate any faster. Thus the great period of technological advance is over. The future will be one of consolidation with what we have. We will diffuse current styles of technology--perhaps improve a little here, a little there, perhaps adapt "American" styles to non-American tastes--but we should not expect much that is essentially new. Thus it would be a great error to expect much further rapid social change, to the extent that such change in the past has been caused by the development of new communication technology. As globe-spanning technologies push themselves into every nation and tribe, we can expect (perhaps) further homogenization, but this is almost wholly predictable and in no way "future-shocking." The whole world may become "modernized" and similar, giving and receiving messages which are essentially the same over pieces of machinery that look and function alike wherever they might be. A new world consensus--a unique world order--may be the consequence of such advance. While this global community may be welcomed or feared, at least it is comprehendible. Its patterns and contours are well-known--they are essentially those of the most advanced parts of the most advanced nations now, different only because of change and local variations of no real consequence in the important analysis.

I must add, however, that some people do very much fear even this development. Not only do they wish to preserve old ways and cultural diversity as such, but they fear that current technologies--especially the computer with its future refinements--may be used by power-mad elites to control, and eventually enslave, the whole world. Able, through centralized control, to use modern technologies to manipulate the mass into obedience--indeed, into very contented obedience--these observers foresee the future as one of "friendly fascism": the people are sufficiently well-fed, well-entertained, and well-provisioned to be unwilling and unable to resist the loss of their libery. Moreover, since this centralized control is likely to be on a global basis, there may very well be no pockets of freedom to resist the totalitarian thrust.

There are other visions--and nightmares--from the future which I might bring to your attention. I believe it is enough simply to say that I cannot be certain what the future will be. Rather, I am much more interested in what the future can and should be from my perspective. So I would like to lead you through the following arguments and see if you, too, conclude that we by no means have come to the end of tremendous opportunities for personal freedom, in part through the further developments of communication technologies. That these technologies may be used for evil, I most readily admit. That safeguards should be established to prevent this, I further agree. That they should not be developed because of the possibility of misuse, I categorically deny. That they cannot even be developed because of some technical or environmental reason, I most certainly am not convinced.

II

The relationship between communication and communications technologies depends in part upon the need, the desire, and the ability to communicate. Earliest human beings scored very low on all three counts. There was little need to "communicate" since humans existed in small, genetically and experientially similar groups. The world was the same to "everyone" in it. By the same token, there was little desire to communicate, and little ability to do so either, since (in their pre-speech condition) early humans were able to communicate only through body contact, cries, or gestures.

As population grew and society slowly became somewhat more complex, the need, desire and ability to communicate also changed. First (apparently) humans learned to talk--an invention of incredible importance for human symbolic and physical manipulation of the environment and of other humans. Hundreds of thousands of years later, perhaps, came drawing, and then writing--communication breakthroughs of great significance in both hardware and software. Indeed, the development of writing technologies was a central necessity for the glory and exploitation called "civilization." Then, with the invention of printing about 5,000 years later, another major shift in human possibilities occurred, the effects of which we are only now beginning to understand. Most recently, electronic technologies seem further to be revolutionizing our society.

Before discussing some technological developments which may lie in the immediate future, let me pause to make the following comments about what seems to me to be the significance of the past:

1. Each new level of technology helped increase humans' conceptual space, and hence modified our own understanding of what it means to be "human."

2. Each new level increased our ability to communicate with more people than was possible at the previous level.

3. Each new level had certain limitations as well as advantages, and itself eventually modified, but did not eliminate, the previous levels of communication technologies.

4. While each new level improved our ability to "say what we mean," in accordance with the Whorfian hypothesis, that also greatly modified what we perceived and hence what we meant to say.

The following comments also seem in order:

1. In the past, the necessity of symbolic manipulation has been a severe handicap characteristic of every communication technology, from speech to the computer. It has been necessary to teach and to learn a common set of "meanings" in order to express what has become an increasingly individualized (i.e., non-consensually determined) set of personal feelings. That is to say, just as primitive humans did not "need" to communicate because they shared essentially equivalent genetic patterns and physical environments, and yet at the same time it was easier for primitive humans to communicate because they did share the same biophysical environment and hence epistemology, so now it is increasingly difficult for humans to communicate, even though it is progressively necessary for them to do so because they differ markedly in their experiences, genetic characteristics, and, hence, values, perceptions and feelings.

2. In addition, communication technology has always been limited by the necessities of human interface. That is, size, visibility, audibility, manipulability--in human terms--limited how small (or large) our communication technology can be. We cannot make a pen smaller than human hands can hold; we cannot print smaller than humans can read; we cannot make TV sets smaller than human eyes can see; we cannot produce radios smaller than human ears can hear; etc.--though we do see progressive miniaturization and mass production of signals and technologies as an obvious trend. But haven't we reached the limits to shrinkage as well as the limits to growth? I suspect we have not. It seems to me that we may be about to overcome these two limitations of our old technologies completely.

1. We are developing new, small--in fact, essentially "invisible"--communication technologies (such as electrodes and drugs) which, in Arthur Clarke's terms, may cause the technology to "vanish, out of sight, into the woodwork."

2. Similarly, these new technologies suggest the possibility of direct human sensory interhookups, presaging the possible elimination of the necessity of common agreement of symbols: we may be able to have direct electrochemical connections between organisms--or between humans and recorded organic stimulations--in such a way that neither symbolic nor physical manipulation is necessary.

III

For several years, what is purported to be a letter from Dr. Donald Kenzotaki has been in circulation. You probably have seen it. At one time it appeared in the British journal, Architectual Design, (September 1969), and it was later reprinted in Intellectual Digest where it was treated as a piece of "science fiction." It very well may be. But to me it in no way sounds beyond our technical capabilities and, thus, I present to you as an illustration of "a possible communication technology of the future" which will, I hope, indicate why I feel that we are by no means at the end of our technological development--and hence our tremendous potentialities for social change. Beyond that--let me

speak frankly--I personally look forward to the type of technology Kenzotaki is describing. Rather than desiring to stabilize at our current levels of communication technology, still less desiring to go back to hand writing or speech technologies only, I would rather embrace the possibilities of incredibly enhanced and enriched interpersonal communication which this technology--and those beyond it--perhaps presages.

Kenzotaki describes a set of experiments which he says derive from, but extend beyond the work on Human Sexuality of Masters and Johnson. Male and female couples are placed in separate rooms and "sensory input devices are attached to the subjects to enregister heartbeat, respiratory rhythm, perspiration through skin conductivity, and emotional activity in the brain through scalp electrodes. These devices permit the registering and communications of the sensations and excitement of the subject during the sexual cycle." These sensations, along with each subject's televised facial expressions and verbal utterings were transmitted to the other member of the pair with the result that the couples were able to experience an apparently complete and thoroughly satisfying sexual experience without ever having actually come into bodily contact with one another.

In a second set of experiments, as described by Kenzotaki, each subject's complete set of sexual responses over a number of different sexual experiences was recorded on computer tape, and one member of the pair was hooked-up, not to the "live" partner, but to the other's recording. The results were said to be the same: the "real" partner was able to derive as total satisfaction from the arrangement as though his or her partner was actually in her (or his) arms.

"Thus," continues Kenzotaki, "through 'Intersex' for direct sensory contact with a distant partner, and 'Cybersex' for relating personally to the tapes of distant partners, communications science may banish loneliness, separation and even death..." Couples "will be able to record on tape and repeat experiences from their earliest courtship, most happy holidays, right through to their maturity and older age."

After reviewing the possible philosophical, moral, legal, and economic problems and opportunities which such a technological advance might entail, Kenzotaki's letter concludes:

"By the end of the century, Hikari expects to see commercial Cybersex tapes, recorded by prominent male and female celebrities, generally available, much as one buys a phonograph recording today. This would undoubtedly enhance the market for home units which would attach to the home communicator or even, if the market has evolved that far, to a home computer."

Yes, I suspect it would "enhance the market" indeed. And if it is possible to communicate sexual feelings and responses thus, can we not also expect the communication of any--and all--other human emotions, and perhaps the development of yet other and more refined ones? What about ideas and "abstract" concepts? Can they likewise be recorded and communicated? To the extent that they are no more than more or less complex electro-chemical impulses in the human nervous system, they certainly should be susceptible of similar communication, it seems to me. Thus, not only "reading and writing," but even speech may be rendered superfluous. If we extend the tehcnology Kenzotaki describes from pairwise coupling to a larger audience, the possibility of temporary--or permanent--group coupling does not seem totally impossible nor improbable.

Problems attendant upon the current "energy crisis" need not be an obstacle to the development of such technologies: it may be that each human body itself contains all the electricity that is needed, with appropriately microminiaturized technologies, to energize such a "network."

No, I find it very difficult to believe that we have come to the end of revolutionary developments in communication technologies. Opportunities for further innovations in human potentiality have by no means been exhausted. We may be at a temporary lull in imagination and nerve, but the future of communication technologies is, at least in some significant part, open, and up to you.

FOCUSED COMMUNICATION OR "NARROWVISION"
by Kenneth O. Sanborn

Commercial television for the masses tells its story in broad stripes. Talk shows, situation comedies, westerns, have a wide appeal and a limited message. "Narrowvision" appeals to the idiosyncratic; ten viewers or one, it provides a more private experience to be shared with the intended receivers only.

An additional property of focused communication is that the television viewer cannot talk back. Sometime in the future Cable television will provide material to narrower bands of citizens in the community. As a two-way system, the community may also discover Cable as a means to talk back to the television source. Now, however, 1/2 inch portable equipment provides the possibility of focused communication, a message hand carried to the viewer.

Focused communication is modeled on the letter or telegram, a message that can be composed so that it expresses the thought intended, provides emotional background and is adapted to the individual receiving person. It arrives with a delay between the time of its production and its presentation so that its tied to momentary events at the time of production have been severed. The sender can think about the message before he makes it and the receiver can play it over any number of times to understand the nuances of the message before he makes reply. The tape can be duplicated, filed, discarded and/or answered.

There are a number of additional properties to focused communication.

1. Groups out of touch with each other can be brought together. Old people may give and receive messages from young people. Groups at a distance can learn of each other, parents can talk with their runaway children. And through being in touch may come together.

2. No intermediary is necessary, the message has a personal quality and speaks for itself.

3. The delay between production and presentation can allow creativity and evaluation to be applied to the message that could not occur in a toe-to-toe, eyeball-to-eyeball confrontation. One may be too shy, in awe, or afraid to make a direct approach but can accomplish more from a distance.

4. One message can be utilized with more than one audience. The old timer who answers the same questions for each social agency he visits could provide a standard recitation of his story and conserve his strength.

5. Self confrontation, by seeing and hearing what your message is before you send it, allows you to focus more clearly the message you want to give.

At The Institute of Behavioral Sciences in Honolulu, we have been experimenting with focused communication for two reasons. One, for itself as a method and two, as a way of getting closer to the messages with which the people in the community are concerned. When our research becomes so sophisticated that it is far removed from everyday concerns, then, a community based agency needs to work at projects that are closer to the grass roots. Focused communication is such a project for us.

As an example of focused communication, we asked the senior Okinawan citizens at the local senior center to give a message to a group of young people at the YWCA. This they did with feeling; the Y-teens thought about the message at a couple of meetings, and then sent a reply. The messages stimulated a discussion among both groups as to their relationship with each other, they expressed enjoyment and eventually began an association on a regular basis.

As focused communication, our illustration is a simple event, yet its humanistic implications loom large for the future of community-based television.

FROM THE MICROBIOLOGICAL TO THE ASTROPHYSICAL IN HUMAN COMMUNICATION
by Andrew Yanoviak

In terms of communication, going back into architectural history, we at first thought that what Egyptians were doing with their ornamentations on those columns was writing hieroglyphic words. Then we found that they weren't words. Hieroglyphics, in fact, are drawn; they were pictures. Only now, with our way of looking at things in terms of the whole world, do we realize that in fact they are symbolic models. Now what are symbolic models?

In terms of symbolic modeling, we see almost nothing in our newspapers and magazines. It is not a part of our language. The wise old Chinese said a picture is worth a thousand words. The mathematician says a symbolic model is worth a thousand pictures. We're all concerned with these breakthroughs in communication. But we haven't found enough ways to improve these means of communication.

I see things visually in terms of perception and I often attempt to communicate beautiful city plans through pictures, through drawings, through models. These symbolic models, by the way, aren't representational; they are more abstract. So in terms of communication, we're talking about an automatic representational model.

Let me jump to my present work. In working with communication, we got to work with communities. And what are the major components of a community that come together? Now we had to start some place in a community. We began with the University. What are the major functions of a University? This University? One is research. Another is education. Another is service. Then, we found that we could no longer study just the University, but we are now going out into the community, the larger community. We had to determine the major components we thought existed within Honolulu. We found those major components were Government, and Industry, as well as University. These are the major components for formulating a community.

We began to interrelate these elements to knowledge, information, experience, other communication modes, and to find out how people were, in fact, communicating in the community.

We found that we not only had research, education and service in the University, we found we also had faculty, students and administrators. We tried to see where and how they fit together. In terms of our community, we also related the classical ideals of man: truth, goodness and beauty. Goodness linked up with Government. Truth with the University. And, Beauty with Industry. That linkage told us what we wanted to know.

It told us that in terms of our environment, we are upside down. I know you can say which way is up. The point is we got the notion of building huge figures, huge tetrahydrons, huge tetrahydron cities. We found the tetrahydrons were linked to growth in nature.

Now, how do you communicate this point? We got into a system of growth whereby the tetrahydrons were coming together and formulating cities for the future. We found we were building an eagle's wing, an expanded structure, a hollow structure. This gave us cities many miles high.

In the process, we put more tetrahydrons together, and we came up with tetrahelical spirals. We put those tetrahelical spirals together, and we formulated the DNA. Then, we realized we were doing some of the things Buckminister Fuller was interested in. What we were doing was trial and error, just fumbling around. We found that five tetrahelical spirals come together to make a DNA. Fuller said there were three. He insisted there were three; I said there were five. We both think we're right. Last May, Dr. Kornberg was here from Stanford. He said they found it fluctuates. There are three and five. There are neither just three nor five. He was talking about pulsation and movement.

When we were drawing our models, we weren't talking about Universities being in a fixed position for a portion of time. We were talking about movement, about dynamic rather than static models. Instead, things would be much more in motion. This room could be on its way to Tokyo--another easy way of going.

We tried to find out how to make another DNA. Some of the structures we have found are between the rocks and us. We thought we would get a linear chain. It didn't happen like that at all.

A very beautiful thing did happen--we came back to an exponential curve: population, communication, transportation, etc. What happens at the extremities of the curves? Catastrophe for man? Some sort of calamity?

People now question civilization. What happens when man comes together? We can ask questions about what happened earlier in Honolulu; we may earlier have had as many people here as we have now at one time. But they did not leave a Waikiki or an Ala Moana Shopping Center. Some of what we are doing may not be necessary. There may be other ways to communicate, to get along, to live.

We then went further to see what happens with a vertical DNA and a horizontal DNA. When you look down on such a model, it looks like an airplane propeller. It has three axes.

Somehow or another, a kind of pulsation comes into play now. The characteristic of life is movement, change, dynamics. These are all parts of life.

The latest speculation is that the DNA is a sphere as well as a non-sphere. Some of our work goes from the microbiological to the astrophysical. We also worked on a solar series as part of this work. It is even more difficult to communicate how a sphere is made like our earth and in terms of our planetary system and how it was formulated. In terms of where we are and where we are going, I care terribly about how our planetary system works, and how our solar system fits in the galaxy. I feel very strongly that these relationships have to do with communication. Taken together, we don't know which way we are going: in or out, up or down

V IMPLICATION AND INTERRELATIONSHIP

AN EMERGENT SYSTEM PARADIGM OF HUMAN COMMUNICATION
by L. S. Harms and Jim Richstad

For more than forty years, the study of communication as a modern field has been defined by Harold D. Lasswell's paradigm, "Who, says What, in which Channel, to Whom, with What Effect," sometimes modified to "Who says What to Whom, How, with what Effect." The paradigm served as an essential research focus for the varied interests that gravitated to the study of communication. As Wilbur Schramm points out, many of these researchers dropped in on the field communication from other disciplines, and often did not tarry long enough for the difficult task of theory building and hypothesis testing. But some did stay, as Schramm notes, and the field of communication became increasingly a distinct scholarly concern. And as the studies accumulated, we found the paradigm was not adequate to cover the field of communication, that it had limiting parameters that isolated the researcher from the full richness of human communication.

To be sure, there have been many exciting and profound developments in the study of human communication within the Lasswell paradigm, such as the rediscovery of the primary groups, the influence of the interpersonal setting on communication, and similar landmarks. But there needs to be more, not simply an extension or enlargement of the paradigm, but a new paradigm.

The neo-Lasswell system paradigm of human communication emerges from the shared concerns of a considerable percentage of mankind. Among the frequent descriptors of the paradigm are the concept terms of participatory and participation, two-way interaction, interchange, message generation, system purpose, need discovery and satisfaction, communication rights, "grassroots," emergent and moral. Specifically, the new paradigm includes both the communication concerns of the common people of what are today called the "emerging nations" as well as the "developed nations." The roots of the theory are anchored in the communication needs of man and the communication rights and responsibilities of mankind. In a profound sense, the paradigm has, therefore, a moral dimension.

Communication revolution is a term that has been used frequently in recent years. It describes both the advent of the communication satellite and a model change in a TV set. Even though the term has been used often enough to make it seem trivial, that usage should not mask the fact that not only in communication technology but in other communication areas as well, radical changes are under way. We are talking about such a radical change here, with an emergent paradigm, a change that meets the usual tests for a scientific revolution as described by Kuhn.

In his discussion of scientific revolutions, Kuhn contrasts normal science with revolutionary science. He observes that normal science is carried on within an established theoretic paradigm. Normal science is a kind of puzzle solving within that accepted paradigm. The emergence of a new theoretic paradigm changes a field; such a paradigm is likely to emerge when dissatisfaction with the existing normal paradigm is most intense. Kuhn observes:

> The...transition to a new paradigm is scientific revolution... Confronted with anamoloy or crisis, scientists take a different attitude toward existing paradigms, and the nature of their research changes accordingly. The proliferation of competing articulations, the willingness to try anything, the expression of explicit

> discontent, the recourse to philosophy and the debate over fundamentals, all these are symptoms of a transition from normal to extraordinary science (Kuhn, 1970:90-91).

These conditions cited by Kuhn describe accurately the dis-ease in the field of communication. There has been increasing frustration and dissatisfaction in communication research, as in other fields, over the inadequacy of the existing paradigm to provide the means of explaining the human communication process. Problem solving within the Lasswell paradigm simply was not enough, and there were important expansions, as noted, into the role of interpersonal relations and social environment in communication. The linear nature of the paradigm--who says what to whom--was important in developing motivation and attitude change research and information acquisition, but had some obvious weaknesses as one-way communication study. Consequently, it is not surprising to discover that a new and powerful theoretic paradigm emerges.

The revolution in the field of human communication brought about by the introduction of a new paradigm is repeated on a large scale across many fields of science. Before examining the normal paradigm and the new paradigm in communication, it is useful to examine the large scale change underway in science, because it provides the broader framework that enables us to see the change in communication as a specific case of a much more general revolutionary transformation.

From the perspective provided by the 1970's, Ashby observes that it is now evident that during the second World War, a profound change began in the two-centuries-long trend in "classic" science-by-analysis associated with the work of Newton and others. Ashby notes:

> So arose the remarkable growth of scientific knowledge from that day to this. But there remained one major difficulty. The method was essentially analytic. Faced with a system, the scientist responded almost automatically by taking it to pieces. Animals were anatomized to organs, organs microscoped down to cells, cells studied as molecules, and molecules smashed to component atoms. The method of analysis tended to become dogma; and, in fact, the reductionists tended to assert that all science was to be advanced in this way alone. ...Any attempts to consider interactions of realistic complexity raised such great difficulties that, in practice, the reductionists always left the task of putting-together to someone else (Ashby, Behavior Science, 18:2-3, 1973).

Classic science is analytic; it is basically linear. It takes systems apart and studies the parts. And it excludes, thereby, those aspects of a system which are in important ways larger than the sum of the system parts. In the case of communication, this approach excludes the interactions.

Ashby credits Fisher with introducing the concept of interaction into science and thereby providing a first major step into the study of systems as systems rather than as a collection of analyzed parts. At about the same time, Weiner and others began to understand "feedback" and out of that work came also the concepts of goal-seeking and purpose.

Ashby continues:

> We might sum this up by saying that "Classic science" was in fact actively reductionist, in that it consistently tried either to remove all interaction between parts or to minimize it, or to make it infinitesimal, or to say it did not exist. This attitude was eminently suitable for many physical and chemical systems, but there were other systems, especially in the biological sciences, in which the interactions were not merely large or important but were actually the center of interest. For such systems "classic" methods were inadequate or even misdirected. So arose the science that frankly accepts interactions as its starting point and then studies the system in ways that preserve, instead of removing, the interaction (Ashby, 1973:5).

Human communication systems are among those which are "rich in internal interaction," or in a word, "explosive." Ashby further notes: "...we must learn to think in quite new ways when we work with richly interactive systems."

In this section, we have asserted that a new paradigm of human communication is now emerging; we tentatively name it a neo-Lasswell theory. We contend that the normal-Lasswell theory that has been in use for the "past forty years" will be first set aside and, subsequently, subsumed by the neo-Lasswell theory. The transition from the normal to the new paradigm constitutes the conditions for a scientific revolution within a field. At the same time, this revolution is a particular instance of the more general shift from classic science to system science. The consequences for the study and practice of human communication promise to be profound.

A Shift in Theoretic Perspective

Paradigm shifts are, of course, the result of many different activities usually spread over time. While often such shifts are highlighted by a particular person or discovery, as Kuhn notes, invariably the build up to such a shift is over a period of time and involves many people. Such is certainly the case of the emergent paradigm here. This will not be a review of those steps but rather a focus on four recent developments or statements and a review of an earlier opening of the normal-Lasswell paradigm.

Appropriately enough, the shift is made explicit by Lasswell himself in a recent major address. Lasswell, in discussing world communication and the quality of world communication, distinguishes between oligarchic and participatory models. With modest liberty, the oligarchic model is taken to be the normal science model in the study of human communication, and the participatory model is the neo-Lasswell system theory paradigm. Lasswell states:

> I. The Oligarchic Model. The power centers of the world arena adhere to development policies at home and abroad that depend on high levels of investment in resource-luxuriant technologies, in this way heightening commitments to wealth and power. In a world that emphasizes the values of material wealth and power, the "revolution of rising frustrations" continues to generate pressure, "from below," and from "out there" for the wider sharing of wealth and power. Provoked by parallel challenges "from below," the oligarchic elites (governmental, industrial, political) come to expect that it is cheaper and less hazardous to evolve toward a unified transnational oligarchy (Washington, Moscow, Peking, Tokyo, for example). In striving to consolidate an oligarchic world public order, the instruments of communication are used to indoctrinate and distract. Chemical and biological and other coercive means are employed to test or correct failures of indoctrination.
>
> II. The Participatory Model. The demand for selective development increases the pressure for investment in intermediate, resource parsimonious technology that minimally disrupts the distribution of population and intensifies demand for the pluralization of values. Excessive concern with wealth and power gives way to a quality and style of life that culminates in expressive acts that are parsimonious in material requirements. Levels of frustration are held in check; oligarchies are deprived of support; the decision process is responsive to persuasive alignments of skill and other pluralistic groups; mass media provide attention opportunities that generate and re-edit common maps of man's past, present and future and strengthen a universal and differentiated sense of identity and common interest.

The oligarchic model is seen here as indicative of the linear, one-way communication system that is particularly characteristic of mass communication, and other source-controlled systems. It is, as Lasswell notes, used to distract and indoctrinate. Much of the research that grew out of the Lasswell paradigm of forty years ago falls into this pattern--the attitude change or effect studies. This preoccupation with effects in studies of public opinion, propaganda, motivation, attitude changes and sales is a natural consequence of a source-to-

receiver paradigm, with emphasis on effects brought about by source or by influence of message variation or media differentiation. This type of research and paradigm is appropriate in such situations as Lasswell describes under the oligarchic model but are not well suited to his participatory model. Mass media are not to indoctrinate or distract but to "provide attention opportunities that generate and re-edit common maps of man's past, present and future and strengthen a universal and differentiated sense of identity and common interest." The normal Lasswell paradigm cannot accommodate the participatory model, and looks to the neo-Lasswell system paradigm of human communication.

One of the significant extensions in the 1950s of the Lasswell paradigm came with the emergence of interpersonal relations as an important factor in communication. People were seen as extensions of the mass media system, as relay points in the system, and it was necessary to study their behavior to understand the communication process. Communication research after Katz and Lazarsfeld had to study the social environment and the character of interpersonal relationships to understand what was happening.

While the work of Katz and Lazarsfeld has been criticized and modified since it was introduced, it stands as one of the landmarks on opening up the Lasswell Paradigm. The two-step flow concept opened the back door of the paradigm, extending the linear concept beyond the receiver of the mass media messages to the social environment and interpersonal networks of the receivers. Although Katz and Lazarsfeld talk of this as interaction, it is not basically interaction between the source and receiver in the mass media concept, but between the receiver and his social communication network. The focus of the research was how the message from the mass media was received in this other network. The goal of the study was clearly "to try to point the way for the planning of research on the transmission of mass persuasion..."

The focus on the receiver and the influence of his social environment is an essential intermediate shift of the paradigm. The Lasswell paradigm in the 1950s took on new dimensions but remained essentially linear, from source to receiver, with an extension into the social networks.

Lerner developed the contrast in paradigms more fully in comments made during the course of a recent conference. Lerner observes:

> For most of the forty years we have been doing modern communication research, we have operated with a paradigm devised by Harold Lasswell which ran:
>
> Who says What to Whom through What Channel with What Effects.
>
> We have studied communication as a linear operation in which a certain sender uses a certain channel to deliver a message to a receiver (an audience) who then is affected in some way by that message. Right from the very beginning of this conference, that paradigm was put aside and dimension by dimension a new one began to emerge.
>
> The dimensions of that new paradigm were evident in a number of papers. For instance, the first paper by Palmore had the title: "The Target that Talks Back." Rosario, in her review of recent theory, finds an emphasis on feedback and interaction in communication studies.
>
> The dimension "and to talk back" is added to the Lasswell paradigm. That "talk back" dimension constitutes a major revision.
>
> Along with a new emphasis on feedback came the parallel insistence on interaction. Bystrom, for instance, stressed that the PEACESAT Project operated as a two-way interactive system. He rejected the old conception of a sender delivering messages to a receiver, and suggested a two-way flow pattern was the desirable one for the future. Two-way interaction adds another important dimension, one that has implications for both theory and practice.

> There were other examples of feedback and interaction. Both Andrus and Horley, in their discussions on cable and satellites, insisted on the importance of interactive feedback relationships in the future of communication. While both the Alaska and Hawaii projects use the early ATS-1 satellite for two-way, interactive communication, the ATS-F and ATS-G satellites facilitate further development of this new conception. Chief Adebo also stressed the need for feedback and interaction in the United Nations. Other participants stressed that every region, every country, every community requires facilities for interactive communication. In a way, it's the sort of thing that a sensitive man like Adlai Stevenson years ago thought about when he said what America needs is a hearing aid.
>
> Today, even sober professionals like ourselves recognize that two-way interaction and feedback are essential concepts in our thinking about communication and its future. As we continued in our discussion, the private and differentiated contrasted sharply with a mass conception of communication. Finally, it becomes evident that the Lasswell paradigm has been revised into: "Who is talking back to who talked to whom." For these reasons, I view this to have been a landmark conference.

Lerner's focus on "who talks back" and "interaction" in human communication recognizes new dimensions to the emergent paradigm, dimensions which cannot be handled by the earlier paradigm. The "obstinate audience" is an active audience, a sharing audience.

Another observer at the same conference said that the new theoretic paradigm both permits and requires new research methods and approaches. Kumata, in this regard, is in agreement with both Ashby and Kuhn. Kumata said:

> We have not been able to pose the kind of questions and appropriate methodologies which are up to the times in terms of looking at the future problem. A great many of us still struggle with techniques which were devised 20-30-40-50 years ago; and while we can use those techniques faster, we haven't been able to get imaginative uses of them. One of the issues in this process will be how to retain, how to keep, or to nurture essential humaneness in the increasing dislocations we will have in the future... Heretofore in communication research, we have picked topics which have deliberately cut down the dimensionality of the variance. In such areas as population communication, however, we are faced with an overwhelming number of things which seem to be related. The increase in the dimensionality and the intensity of what we are dealing with seems to greatly complicate our research attempts.

Kumata is saying that the unidimensional communication research of the past may not be sufficient for such areas as population communication, where there are a great number of variables that have to be taken into account in a rich interactive process. The new questions and methodologies will be needed for the interactive communication research.

These statements, and the cumulative work and development that went into them, confirm the shift from a normal science to a revolutionary science in human communication, with its need for an emergent paradigm.

The Communication Needs of Man

One of the significant aspects of the emergent paradigm is its focus on the human communication needs, as compared to the normal science, source-oriented manipulative purposes of communication. Three levels of needs are assumed to be observable: primary needs, secondary needs, and tertiary needs.

Primary Needs

The primary communication need of man centers around two-way interactive, purposeful, message-generating communication. In particular, normal human development requires a wide range of opportunities for communication of this type. Extreme isolation or certain diseases that interrupt the acquisition or maintenance of this type of communication severely handicap an individual and deprive his community of his participation. It is at this level that the individual can generate identification of needs. Because this type of communication can be high in "information," it is comparatively easy to "overload" a communication system. Consequently, though the class of primary needs delineated here are of first importance, they are in a "modern complex urban society" inadequate by themselves for many communication needs and purposes.

This primary level of communication is universal, no matter what the kind of society or its state of development. Without such communication, there would be no society. Such communication is possible through any interactive media system as well as through interpersonal means. The neo-Lasswell system theory of human communication is rooted in the universal and primary communication needs of man, and emerges from this root base.

Secondary Needs

The secondary communication needs of man, as a class, represent an emphasis of certain system states to the exclusion of others. These needs are met through an "interview" pattern in a communication system. Basically, the communicator poses questions to an "information source." Such "sources" may be other persons in "official roles" such as tourist information officers, librarians, government officials, and so on. Most importantly, they may be a class of systems known as "user-activated" systems and include interactive man-machine communication systems--which promise to become more important in the future. Presumable, they could replace or re-shape a number of the present mass media systems or functions, or at least make the media systems much more responsive to individual communication needs. The "hardware" telecommunication capacity provided to communication satellite links, computer storage and switching, channels provided by broadband cable, and home terminals form a major new capacity to service these secondary communication needs. The need, then, may be characterized as one being higher in communicator specified information accessing while being rather low in interpersonal association or interpersonal involvement. So long as the individual's information requirement is fairly met, "who" the other communicator "is" is clearly of secondary importance.

This level of communication need is clearly a particular creature of the "modern complex urban society." This somewhat autonomous, value-free access to information is essential in a complex modern society, and many of the breakdowns in urban life are attributed, one way or the other, to people not having the quality and quantity of information they need to function adequately in that kind of society, or their lack of skills in such areas. The success of this system is how well or efficiently it provides the desired information (and no extraneous information) to the person seeking it. The news media to an extent fulfill some of the functions at the secondary level, but often inefficiently or only in a very general way. Advances in technology, however, may be transforming much of the present-day mass media from the tertiary level to the secondary level of communication needs. Assumed in the secondary level system is that there is not only free and easy access to such information, but that the collection of the information is done on an open basis, with few restrictions.

With its roots in the primary communication needs of man, the emerging neo-Lasswell system theory accounts readily for secondary communication needs of man. These needs are seen to be basically an information accessing need.

Tertiary Needs

The tertiary needs arise in part when primary and secondary communication needs are not met in a reasonable time and/or at a reasonable cost. They are in large part an artifact of inappropriate communication facilities and

practices in a society. In particular, these needs grow out of and perpetuate an institutionalized imbalance between send-receive functions. The mass media are the obvious institutionalization of this imbalance as are lecture practices in classrooms and most other one-to-many communication systems.

It is, of course, at least partially true that the range of mass media offerings permits individuals to have truly individual information services. Out of the total offerings of the mass media, most of the communication needs of the individual of the non-interactive type could be met. But often this is a great cost and inconvenience, and much needed information goes by unnoticed.

The journalistic function of the mass media is predicated on serving the particular communication needs of its readers or viewers, at least as far as access to current events and ideas is concerned. While this places it outside, generally, of the source-manipulate attitude objectives common in other forms of mass media communication, the great journalistic problem is to present its news in such a way as to meet the diverse and individualistic needs for such communication from its vast audiences. The lesson from the journalistic function is important, however, in the neo-Lasswell paradigm--the express objective of the news function, in the Western context, is to serve the needs of the readers by, again relying on Lasswell, surveying the environment and reporting matters that will be of significance and interest to the readers or other audience. Ideally, this does not have a manipulative or purposive context beyong serving the readers' interest. Of course, this has to be done in such a way that, in a private press system, the media survive financially.

All one-to-many systems are natural and rational extensions of the normal science source-receiver paradigm. As we have an alternate and more comprehensive system paradigm emerging, it is apparent that the mass media are, as a class, one-way systems that operate for source-determined purposes (with the possible journalistic exception). These systems are not nor are they intended to be mutually advantageous for all participants. Further, as a class, the mass media tend to be manipulative in the sense of imposing severe "receiver" requirements for their use, using the "receivers" time inefficiently and placing program "content" beyond his capacity to control. Much of communication research in the past has been designed to discover ways to change attitudes or behaviors in a direction desired by the source, and often to serve the interests of the source. The possible shifting of some of the mass media content into the secondary level would seem to bring more equity into the communication process. It seems unlikely that the communication needs could ever be served entirely at the primary and secondary levels, however, and efforts by the mass media to serve audience needs seem a positive move.

Tertiary communication functions are somewhat universal but vary considerably in both quantity and quality, and, as noted earlier, represent serious sender-receiver imbalances between developed and developing areas of the world, and within national and cultural units.

The emerging paradigm displays governmental and regulatory patterns of mass media in a much clearer light. The rationales for access, fairness, right of reply, and many of the First Amendment questions become much richer when viewed as part of a system of communication needs.

The emerging "neo-Lasswell paradigm of human communication" places a number of persistent questions revolving around the role and operation of the mass media in an easy to analyze framework. First, the maintenance of the media as presently operating are seen to depend on the inadequacies of certain primary and secondary communication needs of man.

In the most far-reaching ways, the emergent "neo-Lasswell system theory of communication" permits re-examination of present communication systems, whether they be free-enterprise, socialistic or other forms, and whether they be in developed or developing nations. Such a re-examination can lead to a significant reshaping and improvement of present communication services, the political structures they support, and the economic interests they presently feed. Such are the immediate and obvious consequences of the development of the emergent theory. When fully developed, it is difficult to say with certainty that any single social institution will remain unaffected.

The Emergent Paradigm

In fundamental terms, the scientific revolution in human communication now under way can be seen as a particular instance of a general shift from classic science to system science. The neo-Lasswell paradigm as seen here is a system theory of human communication.

It is essential to see the neo-Lasswell paradigm as distinctly different from the earlier Lasswell paradigm, and it is important to specify those differences. Lasswell's paradigm is generally modified to this: Who says What to Whom, through what Channel, with what Effects. The key elements for research considerations are, of course, the Who (source or communicator), the What (message), the Whom (audience or receiver), How (use of what channels or media), and Effects (what did it do, usually in terms of knowledge or information acquisition, attitude change or behavior). As noted earlier, this paradigm is quite suited for many of the communication concerns we have within a one-to-many context. As evidenced by the type of communication research conducted under the paradigm, it has a strong element or character of source manipulation of receiver. It does not speak of communication needs, interaction or two-way communication (except in the limited sense of one-way feedback). The paradigm focuses on the source-to-receiver context, even with the Katz and Lazarsfeld extension.

The neo-Lasswell paradigm, as suggested by Lerner, is:

Who is Talking Back to Who Talked to Whom.*

This takes a little sorting out. First, we recognize another Who, but different from the original Who. This Who is someone who is talking back (interactive as the essence) and the other Who is not the Whom of the earlier paradigm but also a fully interactive person. There is a Whom there, retaining also the one-way communication system that was the hallmark of the earlier paradigm, but putting it somewhat to the side as not the main element in the new paradigm. So in this sense, the new paradigm subsumes the old one, but adds the key elements of two-way, interactive communication.

In fundamental terms, the scientific revolution in human communication now underway can be seen as a particular instance of a general shift from classic science to systems science. Thus, the neo-Lasswell paradigm is a system theory of human communication. For the simple but fundamental dyadic communication system, Figure 1 shows the normal science one-way, linear paradigm and the revolutionary science two-way interactive system paradigm.

The system theory paradigm of human communication has several advantageous characteristics. It will be isomorphic with certain systems in other areas of science, that is, it will be similar to other systems which are superficially quite different and, thus, will allow transfer of information about system behavior between systems.

In addition, treating a communication system as a system permits study of the interaction within the system "which is the reason" that a system as a whole is greater than the sum of its parts. In particular, system processes of synergy and serendipity become observable.

From observer, research, management, and reporter views, note that the system approach locates the system observer in a position advantageous to the observing of system interaction.

Also, the normal science paradigm can be seen to be only a partial description of one of four system stages. See Figure 2. Thus, the normal science model obscures the fact that any communicator also receives that which he sends (or imparts).

*A later suggestion was: Who talks back to Those Who talked to Him.

Figure 1: "Classic" Science to System Science Transformation

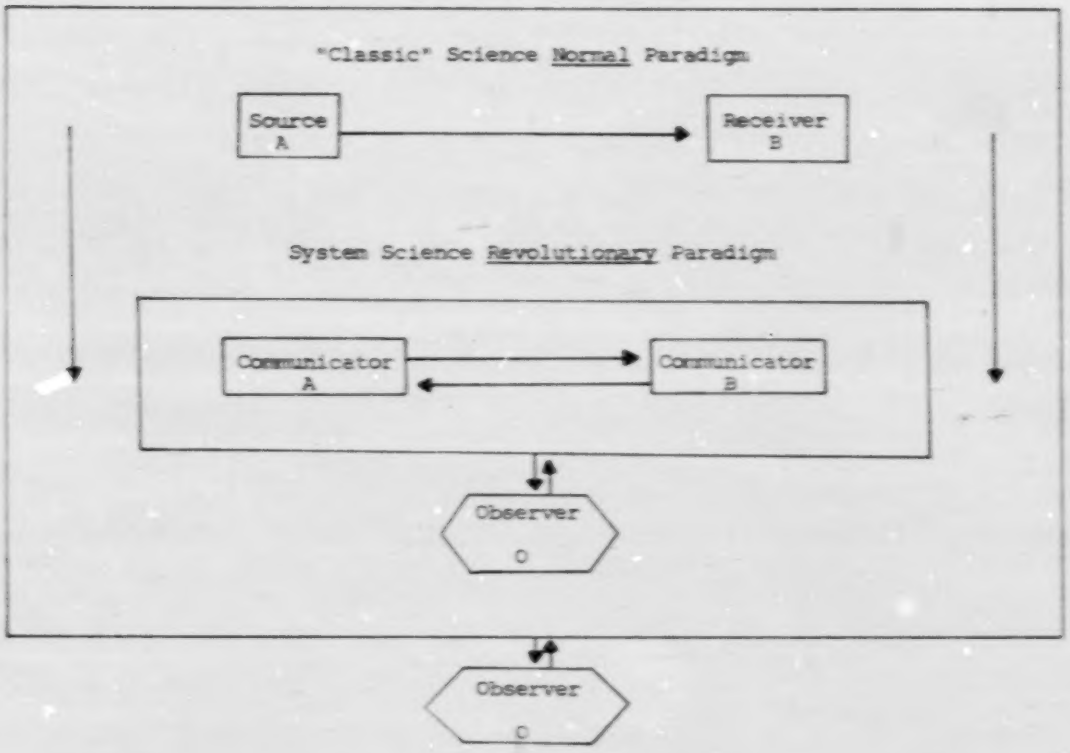
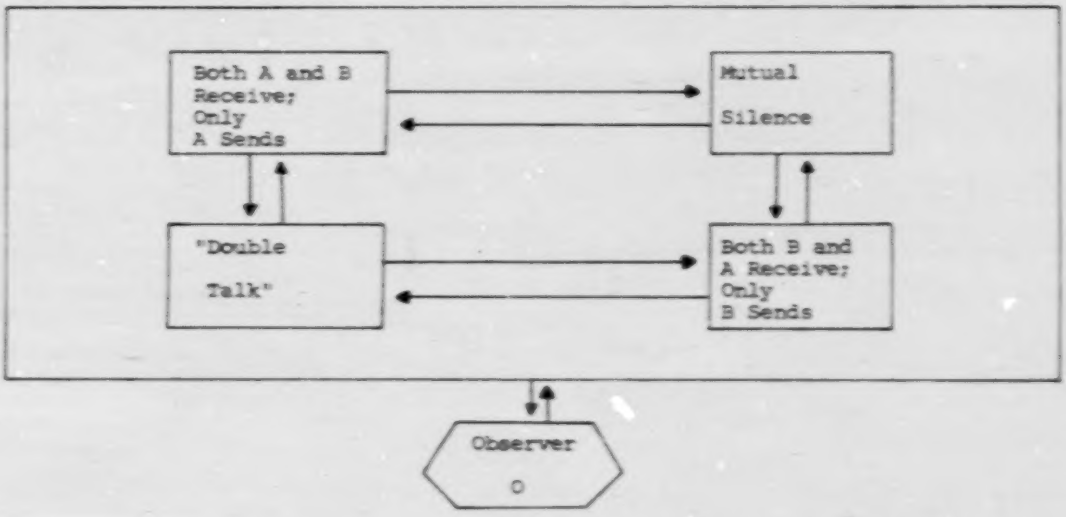


Figure 2: System States



Further, the normal science model focuses on the restricted case where communicator functions only as Source/sender and Communicator B functions as a Receiver who is in some way affected or manipulated as a consequence of, and in a linear way, the prepared message transmitted by Communicator A.

Our purpose here is to assert that we are involved in a major scientific revolution as a consequence of a shift from a normal science to a system science paradigm. The relationship between these two paradigms has been sketched. The full theoretic workout of the emerging paradigm would require a separate monograph in which the theory is clearly specified, the required research methodology is identified or invented, and a few of the critical aspects of the theory submitted to test.

The Communication Rights of Man

Some 200 years ago, as Lerner observes elsewhere, the printing press in Europe launched an imbalance between the communities of the world which continues as we today observe in the growing communication gap between the emerging nations and the developed nations. To a large extent, that communication gap between these nations has been created and continued by the one-way, linear, source-receiver normal science paradigm under which we theorize about and practice communication. Lerner asks for a fair communication policy. How might that come about?

Regardless of where we live, we share one universally neglected guarantee: Article 19 of the Universal Declaration of Human Rights. Article 19 asserts that every individual has the right to "receive and impart" information. The receive-impart imbalance is worldwide. The mass media, the regulations and use patterns that surround them, were developed when these media were assumed to be and to remain scarce. Thus, only a few could send: the many were only to receive. In many cases the entire concept of communication has been seen to be equivalent to the normal science source/receiver paradigm.

The emergent theory briefly sketched here offers the possibility for re-examining and re-shaping human communication. The receive-impart imbalance, begun on a large scale two centuries ago, can be corrected. A balanced and fair communication policy is possible.

We pointed out in the beginning that the emergent "neo-Lasswell system theory of human communication" had a profound moral dimension. That dimension will be developed adequately when all men on earth enjoy in full their Right to Communicate.

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Office of the Secretary, H.E.W.

Horley, Mrs. Jeanette

Howell, Prof. William S., President
Speech Communication Association
Speech Communication
University of Minnesota

Hunsinger, Prof. Paul
Communication, U.H.

Kawashima, Prof. Takehide
Speech Communication
Nihon University
Tokyo

Kella, J. J., President
Keep in Touch Inc.
Honolulu

Kim, Linsu
Student, EWCI

Kim, Young-Yun
Student, EWCI

Kleinjans, Everett
Chancellor
East-West Center

Kleinjans, Mrs. Everett

Konoshima, Sumiye
Resource Materials Specialist, EWCI

Kucera, Geoffrey, Chairman
Educational Communication, U.H.

Kumata, Hideya, Director
International Communication
Institute
Michigan State University
Senior Fellow, EWCI

Lee, Chin-Chuan
Student, EWCI

Lerner, Daniel
Consultant, EWCI
Ford Professor of International
Communication
Massachusetts Institute of
Technology

Lerner, Mrs. Daniel

Lowe, Prof. Clarice
Texas South
Houston, Texas

Mann, Prof. Kenneth
Speech and Dramatic Arts
Church College of Hawaii
Laie, Hawaii

McMillan, Michael E.
Student, U.H.

Meller, Norman, Director
Pacific Islands Program, U.H.

Metter, Gary
Student, EWCI

Moinuddin, Khaja
Student, EWCI

Nadai, Sherry
U.H.

Naniole, Judy

Northrip, Charles
Director of Media Services
University of Alaska

Nose, Prof. Katashi
Department of Physics, U.H.

Ogawa, Taeko
Student, EWCI

Oh, In-Hwan
Student, EWCI

Osborn, Lynn R., Chairman
Speech and Drama
Central Washington State College
Ellensburg, Washington

Palmore, Dr. James
Assistant Director for Institutional
Cooperation
East-West Population Institute
Sociology, U.H.

Pion, Prof. Ronald J.
Obstetrics/Gynecology
School of Public Health, U.H.

Price, Douglas
Assistant to the President, U.H.

Prosser, Prof. Michael, Chairman
International and Intercultural
Commission, Speech Communication
Association
Speech Communication, Indiana Univ.

Radel, David
Staff Researcher, EWCI

Ramachandran, Rasu
Student, EWCI

Ramani, Meherunnissa
Student, EWCI

Richstad, Jim
Research Associate, EWCI

Rickey, Thomas B.
Student, U.H.

Rider, Prof. Richard ..., Chairman
Communication, U.H.

Rosario, Florangel
Research Associate, EWCI

Ross, Raymond S., Professor and
Director
Speech Communication Laboratory
Wayne State University
Detroit, Michigan

Sanborn, Kenneth, Director
Institute of Behavioral Sciences
Honolulu

Schainck, Henry
Student, EWCI

Schnack, George F., M.D.
Honolulu

Seidenstein, Jennifer
Student, EWCI

Smith, Blake
PEACESAT Coordinator
Hilo Campus, U.H.

Smith, Mary
Advisory Council on International
Relations, U.H.

Song, Bok
Student, EWCI

Stanley, Prof. Glenn
University of Alaska

Stein, Norman W.
Instructor in Broadcasting
University of Iowa

Strode, Walter
Straub Clinic
Honolulu

Sumida, Gerald
Vice Chairman of the Commission
on the Year 2000
Honolulu

Thompson, Dr. Marion
American Express Company
Honolulu

Tillotson, Richard
Student, EWCI

Tilton, Floyd, Coordinator
Health Planning, Trust Territory
of the Pacific Islands, U.H.

Tokuza, Akiko
Assistant Professor of English
Tokyo College of Economics

Vasold, M. Amalie, Program Specialist
Coop. Ext. Service, U.H.

Walker, Dr. Robert J.
Professor of Speech
Northwestern Illinois University
Chicago

Warren, Kent
Instructor of Interpersonal
Communication
University of Minnesota
Dept. of Family Practice and
Community Health
Minneapolis

Watson, Donald
Professor and Ext. Specialist, U.H.

Webster, R. Lyle
Director, EWCI

Webster, Mrs. R. Lyle

Wedemeyer, Dan
Financial Aids and Communication, U.H.

Weldon, Prof. Terry
Communication, U.H.

Wetters, Doris, Assistant Director
Human Resources Development
Coop. Ext. Service, U.H.

Wilson, Sherry
Dept. of Family Practice and
Community Health
University of Minnesota

Woodin, Ted, Director
International Students Office, U.H.

Worrall, Robert P.
Research Associate, EWCI

Yamada, Kay M.
Leeward Community College
Pearl City, Hawaii

Yanoviak, Andrew
A.I.A. and New College, U.H.

Yuen, Paul, Associate Dean
College of Engineering, U.H.